

# **Thecus**

## **NVR42/46/55/77/88**

The term "NVR" in this user manual represents  
NVR42/46/55/77/88.

## **User's Manual**

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## **About This Manual**

All information in this manual has been carefully verified to ensure its correctness. In case of an error, please provide us with your feedback. Thecus Technology Corporation reserves the right to modify the contents of this manual without notice.

Product name: Thecus NVR

Manual Version: 1.0













Release Date: July 2010

## **Limited Warranty**

Thecus Technology Corporation guarantees all components of Thecus NVR are thoroughly tested before they leave the factory and should function normally under general usage. In case of any system malfunctions, Thecus Technology Corporation and its local representatives and dealers are responsible for repair without cost to the customer if the product fails within the warranty period and under normal usage. Thecus Technology Corporation is not responsible for any damage or loss of data deemed to be caused by its products. It is highly recommended that users conduct necessary back-up practices.

## Safety Warnings

For your safety, please read and follow the following safety warnings:

-  Read this manual thoroughly before attempting to set up your NVR.
-  Your NVR is a complicated electronic device. DO NOT attempt to repair it under any circumstances. In the case of malfunction, turn off the power immediately and have it repaired at a qualified service center. Contact your vendor for details.
-  DO NOT allow anything to rest on the power cord and DO NOT place the power cord in an area where it can be stepped on. Carefully place connecting cables to avoid stepping or tripping on them.
-  Your NVR can operate normally under temperatures between 0°C and 40°C, with relative humidity of 20% – 85%. Using the NVR under extreme environmental conditions could damage the unit.
-  Ensure that the NVR is provided with the correct supply voltage. Plugging the NVR to an incorrect power source could damage the unit.
-  Do NOT expose the NVR to dampness, dust, or corrosive liquids.
-  Do NOT place the NVR on any uneven surfaces.
-  DO NOT place the NVR in direct sunlight or expose it to other heat sources.
-  DO NOT use chemicals or aerosols to clean the NVR. Unplug the power cord and all connected cables before cleaning.
-  DO NOT place any objects on the NVR or obstruct its ventilation slots to avoid overheating the unit.
-  Keep packaging out of the reach of children.
-  If disposing of the device, please follow your local regulations for the safe disposal of electronic products to protect the environment.

# Table of Contents

<b>Copyright and Trademark Notice .....</b>	<b>2</b>
<b>About This Manual .....</b>	<b>2</b>
<b>Limited Warranty.....</b>	<b>2</b>
<b>Safety Warnings .....</b>	<b>3</b>
<b>Table of Contents .....</b>	<b>4</b>
<b>Chapter 1: Introduction.....</b>	<b>6</b>
Overview .....	6
Package Contents .....	6
Front Panel.....	8
Rear Panel.....	13
<b>Chapter 2: Hardware Installation .....</b>	<b>17</b>
Overview .....	17
Before You Begin .....	17
Hard Disk Installation and Cable Connections .....	17
<b>Chapter 3: First Time Setup .....</b>	<b>24</b>
Overview .....	24
Thecus Setup Wizard .....	24
LCD Operation .....	26
Typical Setup Procedure .....	28
Step 1: Network Setup .....	28
Step 2: RAID Creation .....	29
Step 3: Create Local Users or Setup Authentication .....	29
Step 4: Create Folders and Set Up ACLs.....	29
Step 5: Start Services .....	29
<b>Chapter 4: System Administration .....</b>	<b>30</b>
Overview .....	30
Web Administration Interface .....	30
Menu Bar .....	31
Message Bar .....	31
Logout .....	32
Language Selection .....	32
System Information.....	32
Product Information .....	32
System/Service Status .....	33
Logs .....	33
System Management .....	34
Time: Setting system time .....	35
Notification configuration .....	35
Firmware Upgrade .....	36
UPS Setting .....	37
Utility.....	37
System Network .....	41
WAN Configuration.....	41
LAN .....	42
LAN Configuration.....	42
DHCP Server Configuration.....	42
Samba / CIFS .....	43
Samba Service .....	43
File Access Cache.....	43
Samba Recycle Bin.....	43

Samba Anonymous Login Authentication .....	43
<b>FTP .....</b>	<b>44</b>
<b>Storage Management.....</b>	<b>45</b>
Disks Information .....	45
S.M.A.R.T. Information.....	46
Bad Block Scan.....	47
RAID Information.....	47
Create a RAID .....	48
RAID Level.....	49
Edit RAID .....	50
Remove RAID.....	51
Space Allocation (NVR55 only).....	52
Allocating Space for Target USB Volume.....	53
Share Folder .....	53
Adding Folders .....	53
Modify Folders .....	54
Remove Folders.....	55
Folder and sub-folders Access Control List (ACL) .....	55
<b>User and Group Authentication.....</b>	<b>57</b>
Local User Configuration .....	57
Add Users.....	58
Edit Users.....	58
Remove Users .....	59
Local Group Configuration .....	59
Add Groups.....	60
Edit Groups.....	60
Remove Groups.....	61
<b>Plug-in Management.....</b>	<b>61</b>
<b>Plug-in Installation.....</b>	<b>61</b>
<b>Plug-in.....</b>	<b>62</b>
<b>Appendix A: Product Specifications .....</b>	<b>63</b>
Hardware Specifications .....	63
Software Specifications .....	65
<b>Appendix B: Customer Support.....</b>	<b>67</b>
<b>Appendix C: RAID Basics .....</b>	<b>68</b>
Overview .....	68
Benefits .....	68
Improved Performance .....	68
Data Security .....	68
RAID Levels.....	68
RAID 0 .....	68
RAID 1 .....	68
RAID 5 .....	69
RAID 6 .....	69
RAID 10 .....	69
JBOD .....	69
Stripe Size .....	69
Disk Usage.....	70
<b>Appendix D: Licensing Information .....</b>	<b>71</b>
Overview .....	71
Source Code Availability .....	71
CGIC License Terms.....	72
GNU General Public License .....	72

# Chapter 1: Introduction

## Overview

Thank you for choosing the Thecus NVR Networking Surveillance + Storage Server. The Thecus NVR is an easy-to-use Surveillance storage server that allows a dedicated approach to storing and distributing data on a network. Surveillance data reliability is ensured with RAID features that provide data security and recovery—over multi Terabyte of storage is available using RAID 5 and RAID 6. Gigabit Ethernet ports enhance network efficiency, allowing the NVR to take over file management functions, increase application and data sharing and provide faster data response.

## Package Contents

Your **NVR42** package should contain the following items:

- NVR42 Unit x1
- Power adapter x1
- QIG (Quick Installation and usage Guide) x1
- CD-Title x2 (Universal CDx1 for system setup, Surveillance plug-in x1 for NVR install with license key )
- Ethernet Cable x1
- Screw Kit & Key-Luck x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1

Your **NVR46S/R** package should contain the following items:

- NVR46 Unit x1
- Power Cord
  - NVR46S x1
  - NVR46R x2
- USB Cable x1
- QIG (Quick Installation and usage Guide) x1
- CD-Title x2 (Universal CDx1 for system setup, Surveillance plug-in x1 for NVR install with license key )
- Ethernet Cable x1
- Screw Kit & Key-Luck x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1



Your **NVR55** package should contain the following items:

- NVR55 Unit x1
- Power Cord x1
- USB Cable x1 (B type)
- QIG (Quick Installation and usage Guide) x1
- CD-Title x2 (Universal CDx1 for system setup, Surveillance plug-in x1 for NVR install with license key)
- Ethernet Cable x1
- Screw Kit & Key-Luck x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1

Your **NVR77** package should contain the following items:

- NVR77 Unit x1
- Power Cord x1
- QIG (Quick Installation and usage Guide) x1
- CD-Title x2 (Universal CDx1 for system setup, Surveillance plug-in x1 for NVR install with license key )
- Ethernet Cable x1
- Screw Kit & Key-Luck x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1

Your **NVR88** package should contain the following items:

- NVR88 Unit x1
- Power Cord x2 (NVR88-SP x1)
- QIG (Quick Installation and usage Guide) x1
- CD-Title x2 (Universal CDx1 for system setup, Surveillance plug-in x1 for NVR install with license key )
- Ethernet Cable x1
- Screw Kit & Key-Luck x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1

Please check to see if your package is complete. If you find that some items are missing, contact your dealer.

## Front Panel

### NVR42:

The Thecus NVR42's front panel has the device's controls, indicators, and hard disk trays:

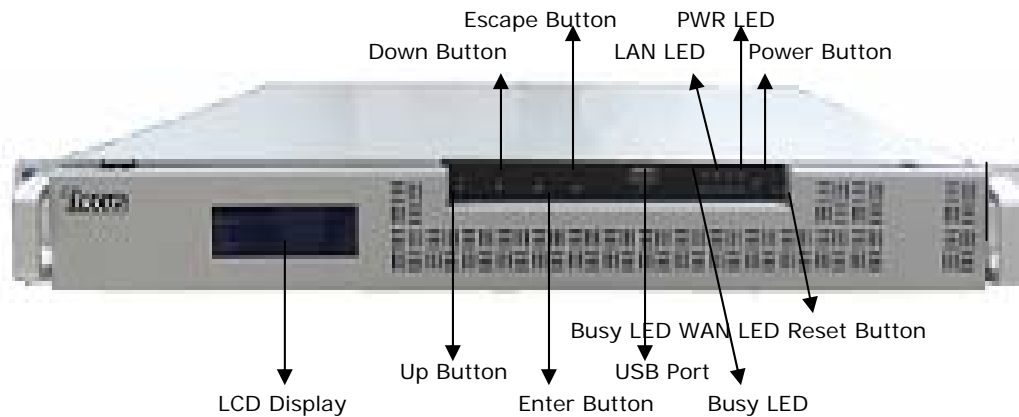


Front Panel		
Item	Description	
Power Button	<ul style="list-style-type: none"> <li>Power on/off NVR42</li> </ul>	
OLED	<ul style="list-style-type: none"> <li>Displays current system status and messages</li> <li>OLED screen saver will be enabled after screen is left idle for more than 3 mins</li> <li>OLED screen will be disabled after it is left idle for more than 6 mins</li> </ul>	
OLED	HDD 1 LED	<ul style="list-style-type: none"> <li><b>Yellow:</b> HDD activity</li> <li><b>Red:</b> HDD failure</li> </ul>
	HDD 2 LED	<ul style="list-style-type: none"> <li><b>Yellow:</b> HDD activity</li> <li><b>Red:</b> HDD failure</li> </ul>
	HDD 3 LED	<ul style="list-style-type: none"> <li><b>Yellow:</b> HDD activity</li> <li><b>Red:</b> HDD failure</li> </ul>
	HDD 4 LED	<ul style="list-style-type: none"> <li><b>Yellow:</b> HDD activity</li> <li><b>Red:</b> HDD failure</li> </ul>
	WAN LED	<ul style="list-style-type: none"> <li><b>Blinking green:</b> network activity</li> </ul>
	LAN LED	<ul style="list-style-type: none"> <li><b>Blinking green:</b> network activity</li> </ul>
	USB Copy	<ul style="list-style-type: none"> <li><b>Blue:</b> USB Copy activity</li> <li><b>Red:</b> USB Copy failure</li> </ul>
HDD Tray	<ul style="list-style-type: none"> <li>Four HDD trays support 4x 3.5" or 4 x 2.5" HDDs</li> </ul>	
USB Copy Button	<ul style="list-style-type: none"> <li>Copy USB storage contents to NVR42</li> </ul>	
USB Port	<ul style="list-style-type: none"> <li>USB 2.0 port for compatible USB devices, such as USB disks.</li> </ul>	



## NVR46:

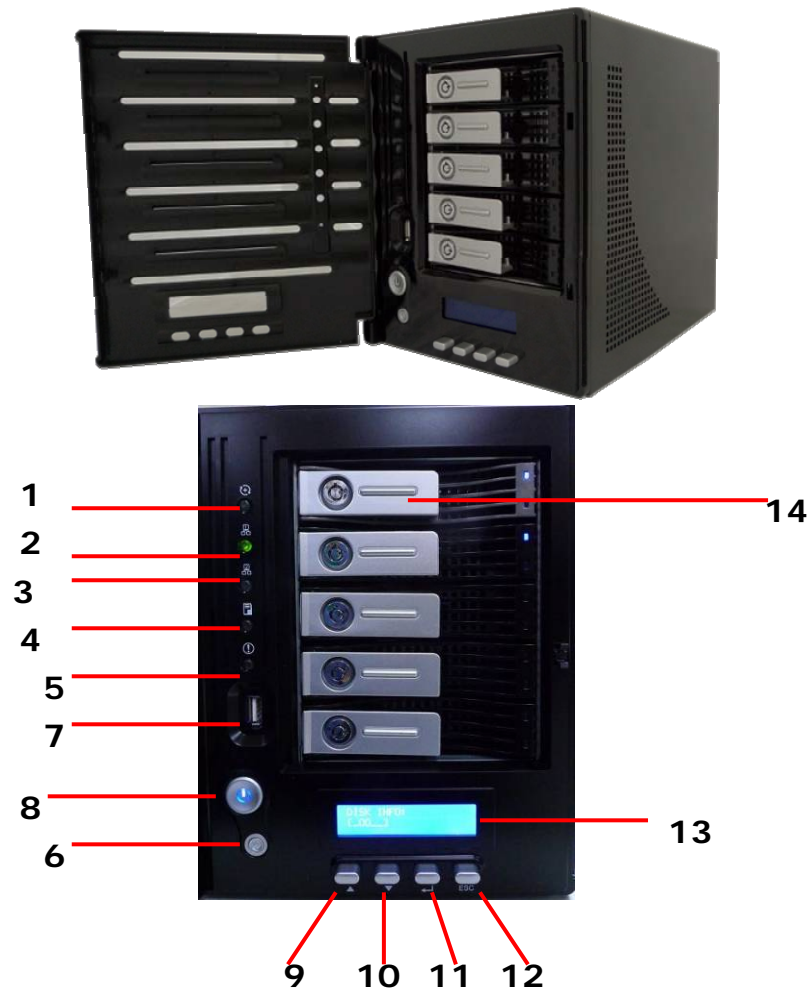
The Thecus NVR46's front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	Description
WAN LED	<ul style="list-style-type: none"><li>• <b>Solid green:</b> network link</li><li>• <b>Blinking green:</b> network activity</li></ul>
LAN LED	<ul style="list-style-type: none"><li>• <b>Solid green:</b> network link</li><li>• <b>Blinking green:</b> network activity</li></ul>
Busy LED	<ul style="list-style-type: none"><li>• <b>Blinking orange:</b> system startup or system maintenance; data currently inaccessible</li></ul>
USB Port	<ul style="list-style-type: none"><li>• USB 2.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers</li></ul>
Power Button	<ul style="list-style-type: none"><li>• Power on/off NVR46</li><li>• <b>Solid blue:</b> Device is powered on</li><li>• <b>Blinking blue:</b> eSATA hard disk is connected and active</li></ul>
Reset Button	<ul style="list-style-type: none"><li>• Resets the NVR46</li><li>• Press for five seconds during boot process to reset IP address and admin password</li></ul>
HDD Trays	<ul style="list-style-type: none"><li>• Four 3.5" SATA HDD trays</li><li>• Locks are provided for added security</li></ul>
LCD Display	<ul style="list-style-type: none"><li>• Displays current system status and warning messages</li><li>• Displays hostname, WAN/LAN IP address, RAID status, and current time</li></ul>
Up Button ▲	<ul style="list-style-type: none"><li>• Push to scroll up when using the LCD display</li></ul>
Down Button ▼	<ul style="list-style-type: none"><li>• Push to scroll down when using the LCD display</li></ul>
Enter Button ↵	<ul style="list-style-type: none"><li>• Push to confirm information entered into the LCD display</li></ul>
Escape Button ESC	<ul style="list-style-type: none"><li>• Push to leave the current LCD menu</li></ul>

## NVR55:

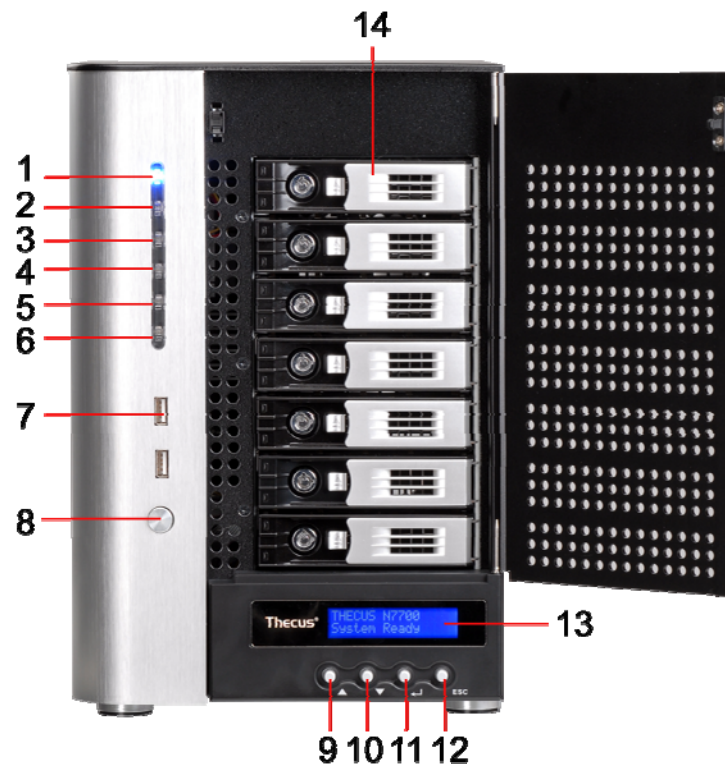
The Thecus NVR55's front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	Description
1.System LED	• <b>Blinking orange:</b> system is being upgraded or system startup; data currently inaccessible
2.WAN LED	• <b>Solid green:</b> network link • <b>Blinking green:</b> network activity
3.LAN LED	• <b>Solid green:</b> network link • <b>Blinking green:</b> network activity
4.USB Copy LED	• <b>Solid blue:</b> files are being copied from a USB storage device
5.Syetem Warning LED	• <b>Solid RED:</b> System error.
6.Reset Button	• Reset system configuration to default value.
7.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks.
8.Power Button/ Power LED	• Power on/off NVR and Power LED. • <b>Solid blue:</b> System is power on.
9.Up Button ▲	• Push to scroll up when using the LCD display
10.Down Button ▼	• Push to enter USB copy operation screen
11.Enter Button ↵	• Push to enter LCD operate password for basic system setting
12.Escape Button ESC	• Push to leave the current LCD menu
13.LCD Display	• Displays current system status and warning messages
14.HDD Trays	• Five 3.5" SATA HDD trays • Locks are provided for added security

## NVR77:

The Thecus NVR77's front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	Description
1.Power LED	<ul style="list-style-type: none"> <li>• <b>Solid blue:</b> System is power on.</li> </ul>
2.System LED	<ul style="list-style-type: none"> <li>• <b>Solid orange:</b> system is being upgraded or system startup; data currently inaccessible</li> </ul>
3.WAN LED	<ul style="list-style-type: none"> <li>• <b>Solid green:</b> network link</li> <li>• <b>Blinking green:</b> network activity</li> </ul>
4.LAN LED	<ul style="list-style-type: none"> <li>• <b>Solid green:</b> network link</li> <li>• <b>Blinking green:</b> network activity</li> </ul>
5.USB Copy LED	<ul style="list-style-type: none"> <li>• <b>Solid blue:</b> files are being copied from a USB storage device</li> </ul>
6.eSATA link LED	<ul style="list-style-type: none"> <li>• <b>Solid blue:</b> external eSATA device has connected</li> </ul>
7.USB Port	<ul style="list-style-type: none"> <li>• USB 2.0 port for compatible USB devices, such as USB disks.</li> </ul>
8.Power Button	<ul style="list-style-type: none"> <li>• Power on/off NVR77</li> </ul>
9.Up Button ▲	<ul style="list-style-type: none"> <li>• Push to scroll up when using the LCD display</li> </ul>
10.Down Button ▼	<ul style="list-style-type: none"> <li>• Push to enter USB copy operation screen</li> </ul>
11.Enter Button ↵	<ul style="list-style-type: none"> <li>• Push to enter LCD operate password for basic system setting</li> </ul>
12.Escape Button <b>ESC</b>	<ul style="list-style-type: none"> <li>• Push to leave the current LCD menu</li> </ul>
13.LCD Display	<ul style="list-style-type: none"> <li>• Displays current system status and warning messages</li> </ul>
14.HDD Trays	<ul style="list-style-type: none"> <li>• Seven 3.5" SATA HDD trays</li> <li>• Locks are provided for added security</li> </ul>

## NVR88:

The Thecus NVR88's front panel has the device's controls, indicators, and hard disk trays:

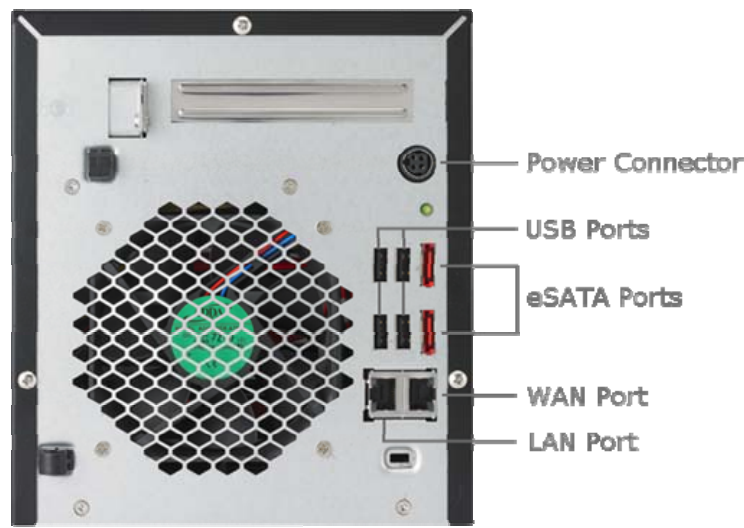



Front Panel	
Item	Description
1.Power Button	• Power on/off NVR88
2.Power LED	• <b>Solid green:</b> System is power on.
3.Reboot Button	• Press to system reboot
4.System fan alarm LED	• <b>Solid red:</b> system fan failure notification
5. Mute button	• Mute the system fan alarm.
6.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks.
7.Up Button ▲	• Push to scroll up when using the LCD display
8.Down Button ▼	• Push to enter USB copy operation screen
9.Enter Button ↵	• Push to enter LCD operate password for basic system setting
10.Escape Button ESC	• Push to leave the current LCD menu

**Rear Panel**

**NVR42:**

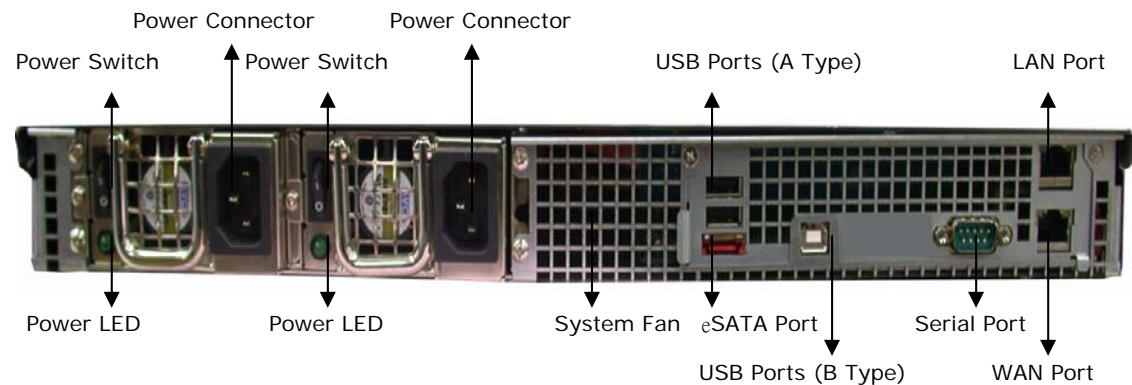
The NVR42 rear panel features ports and connectors.



Item	Description
Power Connector	<ul style="list-style-type: none"><li>For connect the power adaptor</li></ul>
WAN Port	<ul style="list-style-type: none"><li>WAN port for connecting to an Ethernet network through a switch or router</li></ul>
LAN Port	<ul style="list-style-type: none"><li>LAN port for connecting to an Ethernet network through a switch or router</li></ul>
USB Ports 	<ul style="list-style-type: none"><li>USB 2.0 ports for storage expansion</li></ul>
eSATA Ports	<ul style="list-style-type: none"><li>eSATA port for high-speed storage expansion</li></ul>

**NVR46R:**

The rear panel of the NVR46R houses most of the USB and Ethernet connections, as well as the eSATA port, system fan, and power connector. See the table below for descriptions of each:

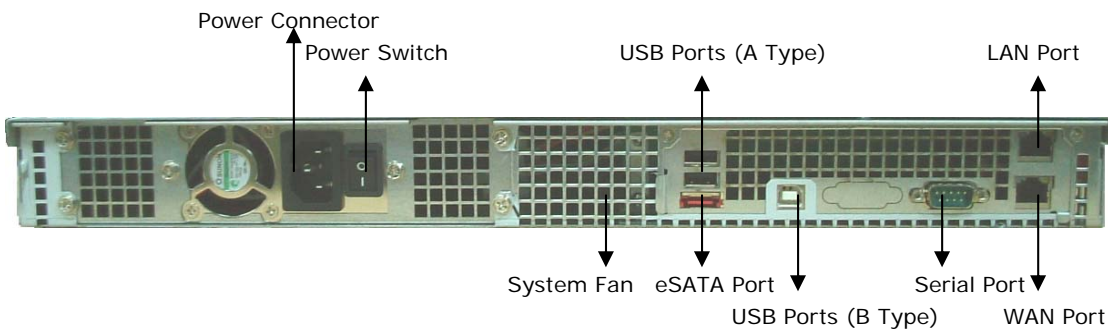


NVR46 Back Panel	
Item	Description
eSATA Port	<ul style="list-style-type: none"><li>eSATA port for high-speed storage expansion</li></ul>

USB Ports	<ul style="list-style-type: none"> <li>• USB 2.0 ports for compatible USB devices, such as digital cameras, USB disks, and USB printers</li> </ul>
WAN Port	<ul style="list-style-type: none"> <li>• WAN port for connecting to an Ethernet network through a switch or router</li> </ul>
LAN Port	<ul style="list-style-type: none"> <li>• LAN port that can be used for connection sharing</li> </ul>
Power Switch	<ul style="list-style-type: none"> <li>• Switch for power supply</li> </ul>
System Fan	<ul style="list-style-type: none"> <li>• System fan that exhausts heat from the unit</li> </ul>
Serial Port	<ul style="list-style-type: none"> <li>• This port is for factory use only</li> </ul>
Power Connector	<ul style="list-style-type: none"> <li>• Connect the included power cords to these connectors</li> </ul>

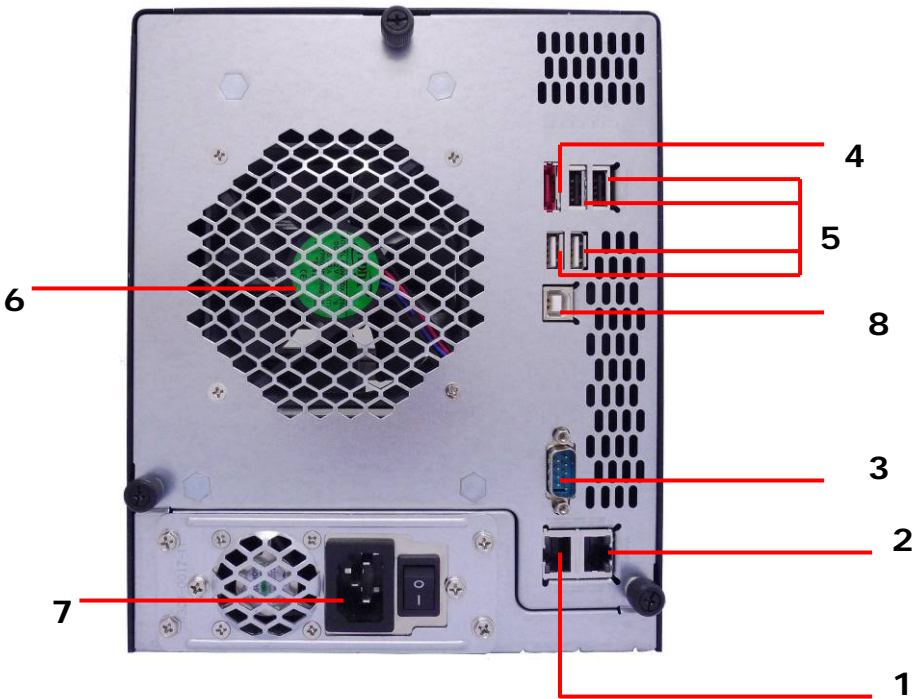
### NVR46S:

The rear panel of the NVR46S is similar to the NVR46R, but with a single power connector:



### NVR55:

The NVR55 rear panel features ports and connectors.



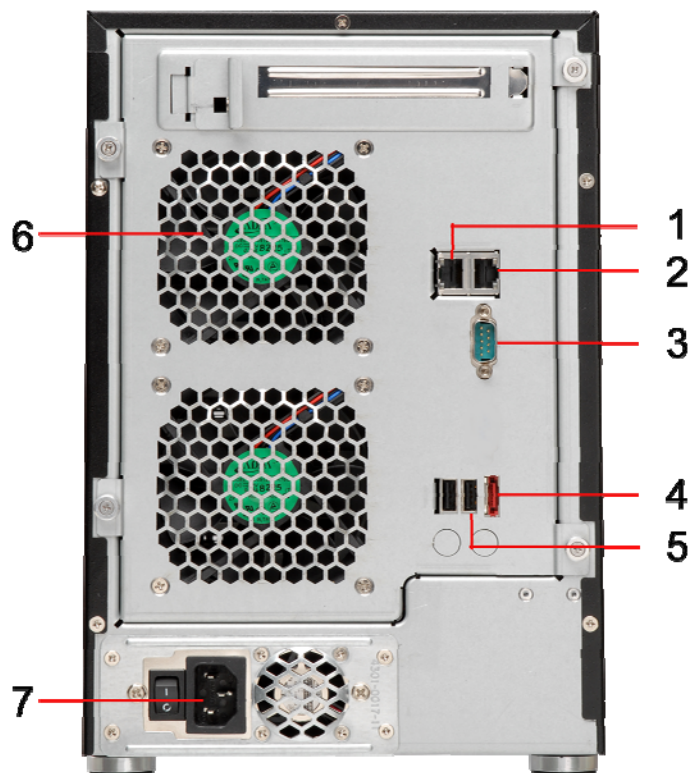
Back Panel	
Item	Description
1.WAN Port	<ul style="list-style-type: none"> <li>• WAN port for connecting to an Ethernet network through a switch</li> </ul>



	or router
2.LAN Port	<ul style="list-style-type: none"> <li>• LAN port for connecting to an Ethernet network through a switch or router</li> </ul>
3.Serial Port	<ul style="list-style-type: none"> <li>• This port is for external UPS device</li> </ul>
4.eSATA Port	<ul style="list-style-type: none"> <li>• eSATA port for high-speed storage expansion</li> </ul>
5.USB Port	<ul style="list-style-type: none"> <li>• USB 2.0 port for compatible USB devices, such as USB disks.</li> </ul>
6.System Fan	<ul style="list-style-type: none"> <li>• System fan that exhausts heat from the unit</li> </ul>
7.Power Connector	<ul style="list-style-type: none"> <li>• Connect the included power cords to these connectors</li> </ul>
8.USB Port	<ul style="list-style-type: none"> <li>• USB 2.0 port to connect PC (Type B of target mode)</li> </ul>

## NVR77:

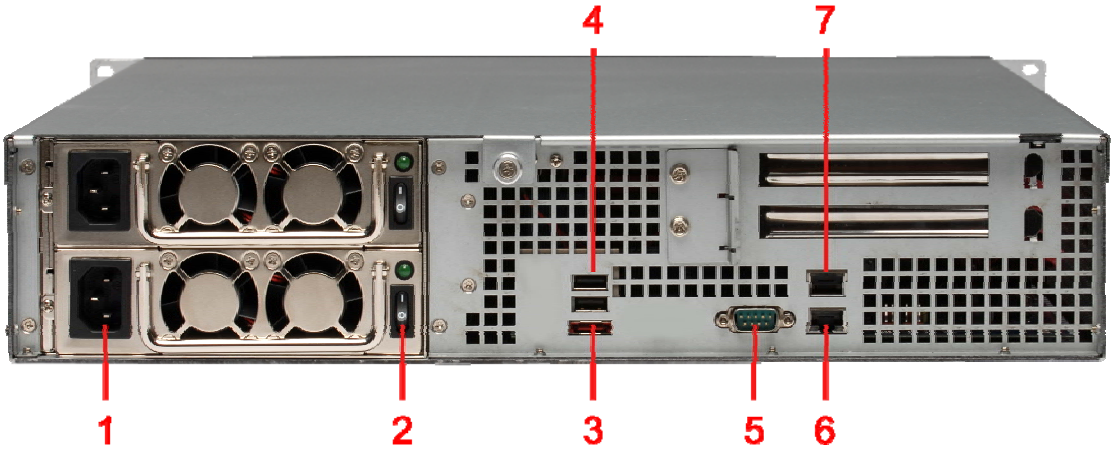
The NVR77 rear panel features ports and connectors.



Back Panel	
Item	Description
1.LAN Port	<ul style="list-style-type: none"> <li>• LAN port for connecting to an Ethernet network through a switch or router</li> </ul>
2.WAN Port	<ul style="list-style-type: none"> <li>• WAN port for connecting to an Ethernet network through a switch or router</li> </ul>
3.Serial Port	<ul style="list-style-type: none"> <li>• This port is for external UPS device</li> </ul>
4.eSATA Port	<ul style="list-style-type: none"> <li>• eSATA port for high-speed storage expansion</li> </ul>
5.USB Port	<ul style="list-style-type: none"> <li>• USB 2.0 port for compatible USB devices, such as USB disks.</li> </ul>
6.System Fan	<ul style="list-style-type: none"> <li>• System fan that exhausts heat from the unit</li> </ul>
7.Power Connector	<ul style="list-style-type: none"> <li>• Connect the included power cords to these connectors</li> </ul>

**NVR88:**

The NVR88 rear panel features ports and connectors.



Back Panel	
Item	Description
1.Power Connector	• Connect the included power cords to these connectors
2.Power Switch	• Switch for power supply
3.eSATA Port	• eSATA port for high-speed storage expansion
4.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks.
5.Serial Port	• This port is for external UPS device
6.WAN Port	• WAN port for connecting to an Ethernet network through a switch or router
7.LAN Port	• WAN port for connecting to an Ethernet network through a switch or router



## Chapter 2: Hardware Installation

### Overview

Your NVR is designed for easy installation. To help you get started, the following chapter will help you quickly get your NVR up and running. Please read it carefully to prevent damaging your unit during installation.

### Before You Begin

Before you begin, be sure to take the following precautions:

1. Read and understand the **Safety Warnings** outlined in the beginning of the manual.
2. If possible, wear an anti-static wrist strap during installation to prevent static discharge from damaging the sensitive electronic components on the NVR.
3. Be careful not to use magnetized screwdrivers around the NVR's electronic components.

### Hard Disk Installation and Cable Connections

#### NVR42:

The NVR42 supports four standard 3.5" (2.5") Serial ATA (SATA) hard disks. To install a hard disk into the NVR42, follow the steps below:

1. Remove a hard disk tray from the NVR42.
2. For 3.5" HDDs
  - a. Remove an HDD tray and install a 3.5" SATA hard disk onto it.
  - b. Slide the HDD tray back into the NVR42 until it snaps into place.



3. For 2.5" HDDs
  - a. Remove an HDD tray and install a 2.5" SATA hard disk onto it.
  - b. Slide the HDD tray back into the NVR42 until it snaps into place.



#### NOTE

If your HDD was part of a RAID 1, RAID 5 or RAID 6 array previously, it automatically rebuilds. If you replace all the drives with higher capacity drives, you will need to go to Administrator login and format the drives.

## Cable Connections

To connect the NVR42 to your network, follow the steps below:

1. Connect an Ethernet cable from your network to the WAN port on the back panel of the NVR42.



2. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket.



3. Press the power button on the Front Panel to boot up the NVR42.



## NVR46:

The NVR46 supports four standard 3.5" Serial ATA (SATA) hard disks. To install a hard disk into the NVR46, follow the steps below:

1. Remove a hard disk tray from the NVR46.
2. Slide the new SATA hard disk into the tray and fasten the screws.
3. Insert the hard disk and tray back into the NVR46 until it snaps into place and lock it with a key if desired.

4. The LED blinks green when the hard disk is accessed. If the Error LED flashes red it signals a problem.

## Cable Connections

To connect the NVR46 to your network, follow the steps below:

4. Connect an Ethernet cable from your network to the WAN port on the back panel of the NVR46.



5. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket. Press the power supply switch to turn on the power supply.

### NOTE

*if you are installing the NVR46R, be sure to connect both power cables. If you do not, the system will assume one power supply has failed, and an alarm will sound. For more information, refer to Chapter 8: Troubleshooting.*



6. Press the power button on the Front Panel to boot up the NVR46.

## NVR55:

The NVR55 supports five standard 3.5" Serial ATA (SATA) hard disks. To install a hard disk into the NVR55, follow the steps below:

5. Remove a hard disk tray from the NVR55.
6. Slide the new SATA hard disk into the tray and fasten the screws.
7. Insert the hard disk and tray back into the NVR55 until it snaps into place and lock it with a key if desired.

8. The LED blinks green when the hard disk is accessed.

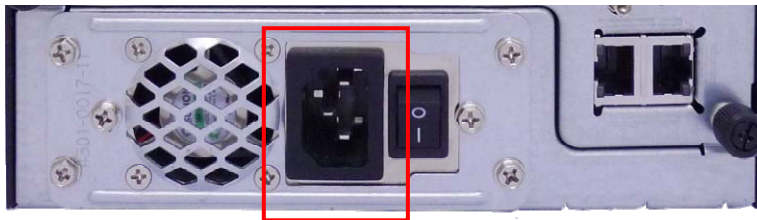
## Cable Connections

To connect the NVR55 to your network, follow the steps below:

7. Connect an Ethernet cable from your network to the WAN port on the back panel of the NVR55.



8. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket. Press the power supply switch to turn on the power supply.



9. Press the power button on the Front Panel to boot up the NVR55.



## NVR77:

The NVR77 supports seven standard 3.5" Serial ATA (SATA) hard disks. To install a hard disk into the NVR77, follow the steps below:

1. Remove a hard disk tray from the NVR77.
2. Slide the new SATA hard disk into the tray and fasten the screws.
3. Insert the hard disk and tray back into the NVR77 until it snaps into place and lock it with a key if desired.

4. The LED blinks green when the hard disk is accessed.

#### NOTE

If your HDD was part of a RAID 1, RAID 5 or RAID 6 array previously, it automatically rebuilds. If you replace all the drives with higher capacity drives, you will need to go to Administrator login and format the drives.

## Cable Connections

To connect the NVR77 to your network, follow the steps below:

1. Connect an Ethernet cable from your network to the WAN port on the back panel of the NVR77.



2. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket. Press the power supply switch to turn on the power supply.



3. Press the power button on the Front Panel to boot up the NVR77.



### **NVR88:**

The NVR88 supports eight standard 3.5" SATA hard disks. To install a hard disk into the NVR88, follow the steps below:

1. Remove a hard disk tray from the NVR88.
2. Slide the new SATA hard disk into the tray and fasten the screws.
3. Insert the hard disk and tray back into the NVR88 until it snaps into place and lock it with a key if desired.
4. The LED blinks green when the hard disk is accessed.

#### **NOTE**

If your HDD was part of a RAID 1, RAID 5 or RAID 6 array previously, it automatically rebuilds. If you replace all the drives with higher capacity drives, you will need to go to Administrator login and format the drives.

### **Cable Connections**

To connect the NVR88 to your network, follow the steps below:

1. Connect an Ethernet cable from your network to the WAN port on the back panel of the NVR88.





2. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protector socket. Press the power supply switch to turn on the power supply.



3. Press the power button on the Front Panel to boot up the NVR88.



## Chapter 3: First Time Setup

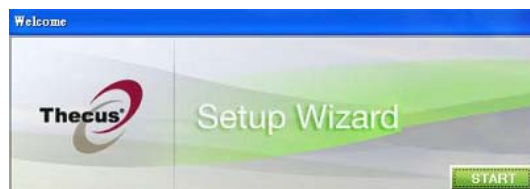
### Overview

Once the hardware is installed, physically connected to your network, and powered on, you can configure the NVR so that it is accessible to your network users. There are two ways to set up your NVR: using the **Thecus Setup Wizard** or the **LCD display**. Follow the steps below for initial software setup.

### Thecus Setup Wizard

The handy Thecus Setup Wizard makes configuring NVR a snap. To configure the NVR using the Setup Wizard, perform the following steps:

1. Insert the installation CD into your CD-ROM drive (the host PC must be connected to the network).
2. The Setup Wizard should launch automatically. If not, please browse your CD-ROM drive and double click on **Setup.exe**.



3. The Setup Wizard will start and automatically detect all Thecus NVR systems on your network.



4. Select the NVR that you like to configure.
5. Login with the administrator account and password. The default account and password are both "admin".





Thecus Setup Wizard

**Login System** Version 1.2.0

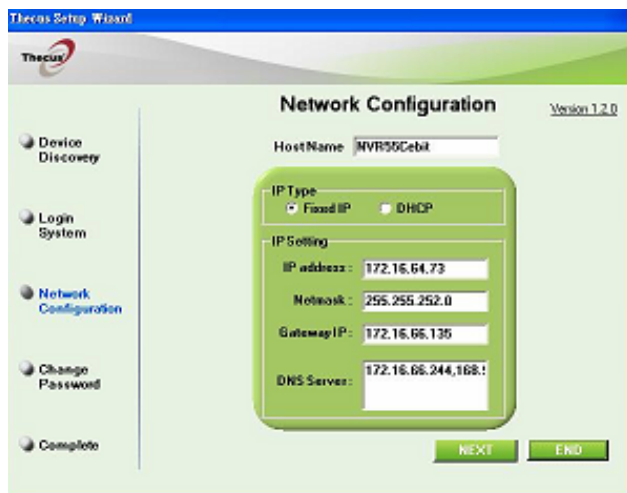
Device Discovery  
Login System  
Network Configuration  
Enable Service  
Hard Disks Setup  
Change Password  
Complete

Admin ID:

Password:

PREV NEXT END

6. Name your NVR and configure the network IP address. If your switch or router is configured as a DHCP Server, configuring the NVR to automatically obtain an IP address is recommended. You may also use a static IP address and enter the DNS Server address manually.



Thecus Setup Wizard

**Network Configuration** Version 1.2.0

Device Discovery  
Login System  
Network Configuration  
Change Password  
Complete

HostName:

IP Type:  
☒ Fixed IP ☐ DHCP

IP Setting:  
 IP address:   
 Netmask:   
 Gateway IP:   
 DNS Server:

NEXT END

7. Change the default administrator password.



Thecus Setup Wizard

**Change Password** Version 1.2.0

Device Discovery  
Login System  
Network Configuration  
Change Password  
Complete

New Password:

Confirm Again:

PREV APPLY END

8. Finished! Access the NVR Web Administrator Interface by pressing the **Start Browser** button. You can also configure another NVR at this point by clicking the **Setup Other Device** button. Press **Exit** to exit the wizard.



## NOTE

The Thecus Setup Wizard is designed for installation on systems running Windows XP/2000/7. Users with other operating systems will need to install the Thecus Setup Wizard on a host machine with one of these operating systems before using the unit.

## LCD Operation

The NVR is equipped with an LCD on the front for easy status display and setup. There are four buttons on the front panel to control the LCD functions.

### NVR42:

## OLED Operation

The NVR42 is equipped with an OLED on the front for easy status display and setup. There are four buttons on the front panel to control the OLED functions.

## OLED Controls

Use the **Up** (▲), **Down** (▼), **Enter** (↵) and **Escape** (ESC) keys to select various configuration settings and menu options for NVR42 configuration.

The following table illustrates the keys on the front control panel:

### OLED Controls

Icon	Function	Description
▲	Up Button	Select the previous configuration settings option.
▼	Down Button	USB copy confirmation display.
↵	Enter	Enter the selected menu option, sub-menu, or parameter setting.
ESC	Escape	Escape and return to the previous menu.

There are two modes of operation for the OLED: **Display Mode** and **Management Mode**.

## Display Mode

During normal operation, the OLED will be in **Display Mode**.

Display Mode	
Item	Description
Host Name	Current host name of the system.
WAN	Current WAN IP setting.
LAN	Current LAN IP setting.
Link Aggregation	Current Link Aggregation status
System Fan	Current system fan status.
CPU Fan	Current CPU fan status
2009/05/22 12:00	Current system time.
RAID	Current RAID status.

The NVR42 will rotate these messages every one-two seconds on the OLED display.

## NVR55/NVR77/NVR88:

### LCD Controls

Use the **Up** (▲), **Down** (▼), **Enter** (↵) and **Escape** (ESC) keys to select various configuration settings and menu options for NVR configuration.

The following table illustrates the keys on the front control panel:

LCD Controls		
Icon	Function	Description
▲	Up Button	Select the previous configuration settings option.
▼	Down Button	USB copy confirmation display.
↵	Enter	Enter the selected menu option, sub-menu, or parameter setting.
ESC	Escape	Escape and return to the previous menu.

There are two modes of operation for the LCD: **Display Mode** and **Management Mode**.

### Display Mode

During normal operation, the LCD will be in **Display Mode**.

Display Mode	
Item	Description
Host Name	Current host name of the system.
WAN	Current WAN IP setting.
LAN	Current LAN IP setting.
Link Aggregation	Current Link Aggregation status
System Fan	Current system fan status.
CPU Fan	Current CPU fan status
2009/05/22 12:00	Current system time.
Disk Info	Current status of disk slot has been installed
RAID	Current RAID status.

The NVR will rotate these messages every one-two seconds on the LCD display.

## USB Copy

The USB Copy function enables you to copy files stored on USB devices such as USB disks and digital cameras to the NVR by press button. To use USB copy, follow the steps below:

1. Plug your USB device into an available USB port on the Front end.
2. In **Display Mode**, press the **Down Button (▼)**.
3. The LCD will display "**USB Copy?**"
4. Press **Enter (↵)** and the NVR will start copying USB disks connected to the front USB port.
5. All of data will be copied into system folder named "USB copy".

## Management Mode

During setup and configuration, the LCD (OLED) will be in **Management Mode**.

To enter into Management Mode, press **Enter (↵)** and an "*Enter Password*" prompt will show on the LCD(OLED).

At this time, the administrator has to enter the correct LCD (OLED) password. System will check whether the correct LCD (OLED) password has been entered. The default LCD (OLED) password is " 0000 ". If correct password is entered, you will enter into the **Management Mode** menu.

Management Mode	
Item	Description
WAN Setting	IP address and netmask of your WAN ports.
LAN Setting	IP address and netmask of your LAN ports.
Link Agg. Setting	Select <b>Disable</b> or <b>Failover</b> .
Change Admin Passwd	Change administrator's password for LCD (OLED) operation.
Reset to Default	Reset system to factory defaults.
Exit	Exit <b>Management Mode</b> and return to <b>Display Mode</b> .

### NOTE

You can also change your LCD password using the Web Administration Interface by navigating to **System Management >Utility>Administrator Password**. For more on the Web Administration Interface, see **Chapter 4: System Management**.

## Typical Setup Procedure

From the Web Administration Interface, you can begin to setup your NVR for use on your network. Setting up the NVR typically follows the five steps outlined below.

For more on how to use the Web Administration Interface, see **Chapter 4: Web Administration Interface**.

### Step 1: Network Setup

From the Web Administration Interface, you can configure the network settings of the NVR for your network. You can access the **Network** menu from the menu bar. For details on how to configure your network settings, refer to **Chapter 4: System Network**.

## Step 2: RAID Creation

Next, administrators can configure their preferred RAID setting and build their RAID volume. You can access RAID settings from the menu bar of the Web Administration Interface by navigating to **Storage Management > RAID Configuration**.

For more information on configuring RAID, see

**Chapter 4: System Management > [RAID Configuration](#)**.

Don't know which RAID level to use? Find out more about the different RAID levels from [Appendix C: RAID Basics](#).

## Step 3: Create Local Users or Setup Authentication

Once the RAID is ready, you can begin to create local users for the NVR.

For more on managing users, go to **Chapter 4: [User and Group Authentication](#)**.

## Step 4: Create Folders and Set Up ACLs

Once users are introduced into your network, you can begin to create various folders on the NVR and control user access to each using Folder Access Control Lists.

More information on managing folders, see

**Chapter 4: Storage Management > [Share Folder](#)**.

To find out about configuring Folder Access Control Lists, see **Chapter 4: Storage Management > Share Folder > [Folder Access Control List \(ACL\)](#)**.

## Step 5: Start Services

Finally, you can start to setup the different services of the NVR for the users on your network. You can find out more about each of these services by clicking below:

[SMB/CIFS](#)

[File Transfer Protocol \(FTP\)](#)

## Chapter 4: System Administration

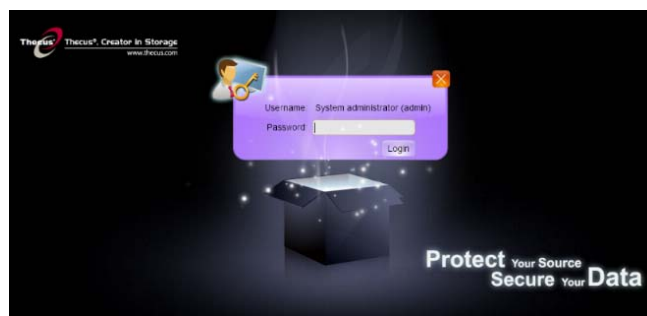
### Overview

The NVR provides an easily accessible **Web Administration Interface**. With it, you can configure and monitor the NVR anywhere on the network.

### Web Administration Interface

Make sure your network is connected to the Internet. To access the NVR **Web Administration Interface**:

1. Type the NVR's IP address into your browser. (Default IP address is `http://192.168.1.100`)



#### NOTE

Your computer's network IP address must be on the same subnet as the NVR. If the NVR has default IP address of 192.168.1.100, your managing PC IP address must be 192.168.1.x, where x is a number between 1 and 254, but not 100.

2. Login to the system using the administrator user name and password. The factory defaults are:

**User Name:** admin

**Password:** admin

※ If you changed your password in the setup wizard, use the new password.

Once you are logged in as an administrator, you will see the **Web Administration Interface**. From here, you can configure and monitor virtually every aspect of the NVR from anywhere on the network.

## Menu Bar

The **Menu Bar** is where you will find all of the information screens and system settings of the NVR. The various settings are placed in the following groups on the menu bar:



Menu Bar	
Item	Description
System Information	Current system status of the NVR.
System Management	Various NVR system settings and information.
System Network	Information and settings for network connections, as well as various services of the NVR.
Storage	Information and settings for storage devices installed into the NVR.
User and Group Authentication	Allows configuration of users and groups.
Plug-in Management	To manage NVR plug-in module.





Moving your cursor over any of these items will display the dropdown menu selections for each group.



In the following sections, you will find detailed explanations of each function, and how to configure your NVR.

## Message Bar

You can get information about system status quickly by moving mouse over.



Message Bar		
Item	Status	Description
	RAID Information.	Display the status of created RAID volume. Click to go to RAID information page as short cut.
	Disks Information.	Display the status of disks installed in the system. Click to go to Disk information page as short cut.
	FAN.	Display system FAN Status. Click to go to System Status page as short cut.
	UPS.	Display UPS device status. Click to go to UPS Setting page as short cut.

	Temperature.	Green: Systematic temperature is normal. <b>Red:</b> Systematic temperature is unusual. Click to go to System Status page as short cut.
	Network.	Green: Connection to network is normal. <b>Red:</b> abnormal connection to the network

## Logout

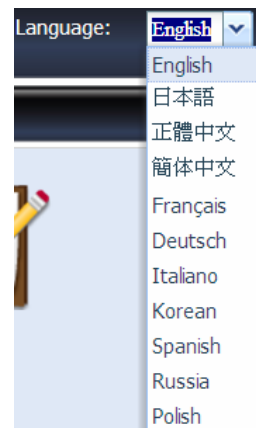


Click to logout Web Administration Interface.

## Language Selection

The NVR supports multiple languages, including:

- English
- Japanese
- Traditional Chinese
- Simplified Chinese
- French
- German
- Italian
- Korean
- Spanish
- Russia
- Polish

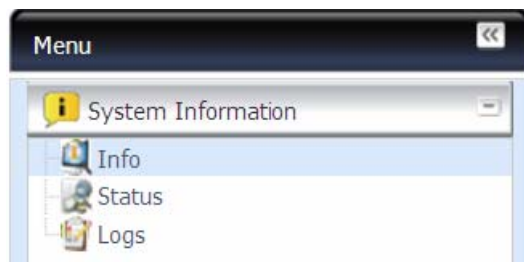


On the menu bar, click **Language** and the **selection** list appears. This user interface will switch to selected language for the NVR.

## System Information

Information provides viewing on current Product info, System Status, Service Status and Logs.

The menu bar allows you to see various aspects of the NVR. From here, you can discover the status of the NVR, and also other details.



## Product Information

Once you login, you will first see the basic **Product Information** screen providing **Manufacturer**, **Product No.**, **Firmware Version**, and **System Up Time** information.



Product Information	
Manufacturer	Thecus
Product No.	NVR55
Firmware Version	Beta100514
Up Time	2 days 1 hour 8 minutes

Product Information	
Item	Description
Manufacturer	Displays the name of the system manufacturer.
Product No.	Shows the model number of the system.
Firmware version	Shows the current firmware version.
Up time	Displays the total run time of the system.

## System/Service Status

From the **Status** menu, choose the **System** item, **System Status** and **Service Status** screens appear. These screens provide basic system and service status information.

System Status	
CPU Loading(%)	100%
CPU Fan Speed	OK
System Fan 1 Speed	OK
Up Time	2 days 1 hour 12 minutes

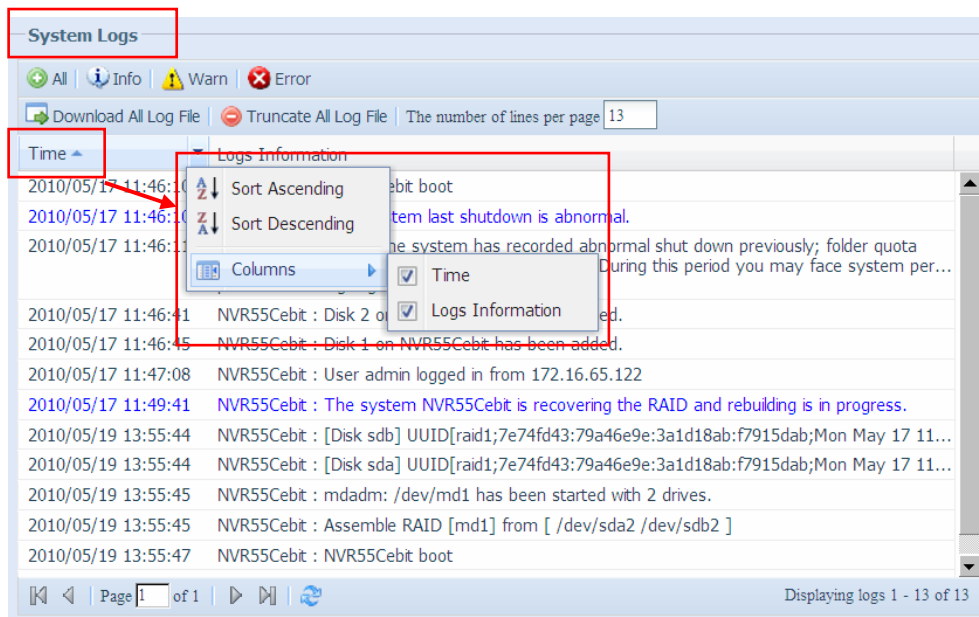
Service Status	
SMB/CIFS Status	Running
FTP Status	Stop

System Status	
Item	Description
CPU Loading (%)	Displays current CPU workload of the NVR.
CPU Fan Speed	Displays current CPU fan status.
System Fan Speed	Displays the current status of the system fan.
Up Time	Shows how long the system has been up and running.


Service Status	
Item	Description
SMB/CIFS Status	The status of the SMB/CIFS server.
FTP Status	The status of the FTP server.

## Logs

From the **System Information** menu, choose the **Logs** item and the **System Logs** screen appears. This screen shows a history of system usage and important events such as disk status, network information, and system booting. See the following table for a detailed description of each item:

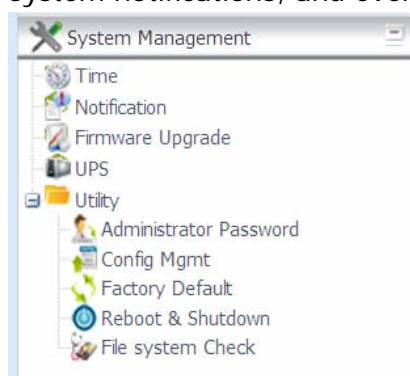


See the following table for a detailed description of each item:

System Logs	
Item	Description
All	Provides all log information including system messages, warning messages and error messages.
INFO	Records information about system messages.
WARN	Shows only warning messages.
ERROR	Shows only error messages.
Download All Log File	Export all logs to an external file.
Truncate All Log File	Clear all log files.
The number of lines per page <input type="text" value="13"/>	Specify desired number of lines to display per page.
Sort Ascending	Shows logs by date in ascending order.
Sort Descending	Shows logs by date in descending order.
<< < > >>	Use the forward ( > >>   ) and backward (   << < ) buttons to browse the log pages.
	Re-loading logs.

## System Management

The **System Management** menu gives you a wealth of settings that you can use to configure your NVR's system administration functions. You can set up system time, system notifications, and even upgrade firmware from this menu.



## Time: Setting system time

From the **time** menu, choose the **Time** item and the **Time** screen appears. Set the desired **Date**, **Time**, and **Time Zone**. You can also elect to synchronize the system time on the NVR with an **NTP (Network Time Protocol) Server**.

**Setting system time**

Date: 05/21/2010

Time: 15:09

Time Zone: Asia/Taipei

Act as NTP Server: ☐ Enable ☒ Disable

Sync with external NTP server: ☒ Yes ☐ No

clock.isc.org

Apply

See the following table for a detailed description of each item:

Time	
Item	Description
Date	Sets the system date.
Time	Sets the system time.
Time Zone	Sets the system time zone.
Act as NTP Server	Select <b>Enable</b> to synchronize with the NTP server. Select <b>Disable</b> to close the NTP server synchronization.
Sync with external NTP Server	Select <b>YES</b> to allow the NVR to synchronize with an NTP server of your choice. Press <b>Apply</b> to change.

### WARNING

If an NTP server is selected, please make sure your NVR55's network has been setup to access the NTP server.

## Notification configuration

From the menu, choose the **Notification** item, and the **Notification Configuration** screen appears. This screen lets you have the NVR notify you in case of any system malfunction. Press **Apply** to confirm all settings. See following table for a detailed description of each item.

**Notification Configuration**

Beep Notification ☒ Enable ☐ Disable

Email Notification ☐ Enable ☒ Disable

SMTP Server:  Port:

Auth Type:

SMTP Account ID:

Account Password:

E-Mail From:

Receiver's E-Mail Address 1:

Receiver's E-Mail Address 2:

Receiver's E-Mail Address 3:

Receiver's E-Mail Address 4:

Notification Configuration	
Item	Description
Beep Notification	Enable or disable the system beeper that beeps when a problem occurs.
Email Notification	Enable or disable email notifications of system problems.
SMTP Server	Specifies the hostname/IP address of the SMTP server.
Port	Specifies the port to send outgoing notification emails.
Auth Type	Select the SMTP Server account authentication type.
SMTP Account ID	Set the SMTP Server Email account ID.
Account Password	Enter a new password.
E-mail From	Set email address to send email.
Receiver's E-mail Address (1,2,3,4)	Add one or more recipient's email addresses to receive email notifications.


## NOTE

Consult with your mail server administrator for email server information.


## Firmware Upgrade

From the menu, choose the **Firmware Upgrade** item and the **Firmware Upgrade** screen appears.

**Firmware Upgrade**

firmware:  

Follow the steps below to upgrade your firmware:

1. Use the **Browse** button  to find the firmware file.
2. Press **Apply**.
3. The beeper beeps and the Busy LED links until the upgrade is complete.

## NOTE

- The beeper only beeps if it is enabled in the System Notification menu.
- Check Thecus website for the latest firmware release and release notes.
- Downgrading firmware is not permitted.

## WARNING

Do not turn off the system during the firmware upgrade process .  
This will lead to a catastrophic result that may render the system inoperable.

### UPS Setting

The NVR can also support various uninterruptible power supply units via either "Serial" or "USB" interface, providing extra data security and accessibility in the case of a power failure.

From the **Status** menu, choose the **UPS** item and the **UPS Setting** screen appears. Make any changes you wish, and press **Apply** to confirm changes.

**UPS Setting**

UPS monitoring: ☐ Enable ☒ Disable

Manufacturer:

Model:

( \* means the product has been tested for Compatibility )

Battery Status: N/A

Power: N/A

Seconds between power failure and first notification:  5 s

Seconds between subsequent power failure notifications:  20 s

Shutdown the system when the battery charge is less than  5 %

See the following table for a detailed description of each item.

UPS Setting	
Item	Description
UPS Monitoring	Enable or disable UPS monitoring.
Manufacturer	Choose the UPS manufacturer from the dropdowns.
Model	Choose the UPS model number from the dropdowns.
Battery Status	Current status of the UPS battery
Power	Current status of the power being supplied to the UPS
Seconds between power failure and first notification	Delay between power failure and first notification in seconds.
Seconds between subsequent power failure notifications	Delay between subsequent notifications in seconds.
Shutdown the system when the battery charge is less than	Amount of UPS battery remaining before system should auto-shutdown.
Apply	Press <b>Apply</b> to save your changes.

### Utility

#### Administrator password

From the menu, choose the **Administrator Password** item and the **Change Administrator Password** screen appears. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press **Apply** to confirm password changes.

There is also **password** for enter **LCD** setting you could setup here. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press **Apply** to confirm password changes.

The image shows two web forms for changing passwords. The first form, titled 'Change Administrator Password', contains two text input fields labeled 'New Password:' and 'Confirm Password:', followed by an 'Apply' button. A red rectangular box highlights these three elements. The second form, titled 'Change Display Module Password', also contains 'New Password:' and 'Confirm Password:' text input fields and an 'Apply' button.

See the following table for a detailed description of each item.

Change Administrator and LCD Entry Password	
Item	Description
New Password	Type in a new administrator password.
Confirm Password	Type the new password again to confirm.
Apply	Press this to save your changes.

### · Config Mgmt

From the menu, choose the **Config Mgmt** item and the **System Configuration Download/Upload** screen appears. From here, you can download or upload stored system configurations.

The image shows the 'System Configuration Download/Upload' interface. It includes an 'Upload:' label, a text input field with the placeholder text 'Please choose a file to upload.', and a file selection icon (a folder with a plus sign). Below the input field are two buttons: 'Upload' and 'Download'.

See the following table for a detailed description of each item.

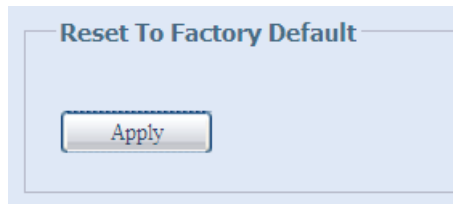
System Configuration Download/Upload	
Item	Description
Download	Save and export the current system configuration.
Upload	Import a saved configuration file to overwrite current system configuration.

### NOTE

Backing up your system configuration is a great way to ensure that you can revert to a working configuration when you are experimenting with new system settings. The system configuration you have backup can be only restore in same firmware version. And the backup details have excluded user/group accounts.

#### · **Factory default**

From the menu, choose the **Factory Default** item and the **Reset to Factory Default** screen appears. Press **Apply** to reset the NVR to factory default settings.

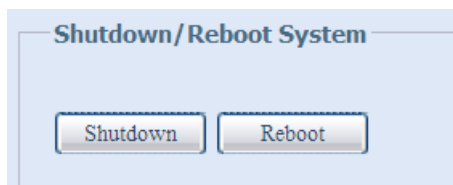


#### **WARNING**

Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

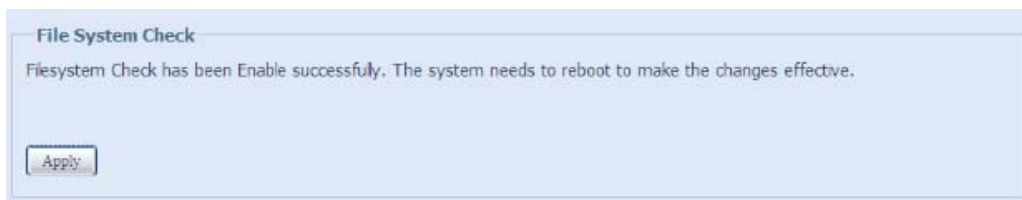
#### · **Reboot & Shutdown**

From the menu, choose **Reboot & Shutdown** item, and the **Shutdown/Reboot System** screen appears. Press **Reboot** to restart the system or **Shutdown** to turn the system off.



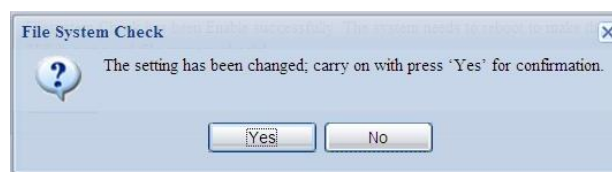
#### · **File System check**

The File System Check allows you to perform a check on the integrity of your disks' file system. Under the menu, click **File system Check** and the **File System Check** prompt appears.

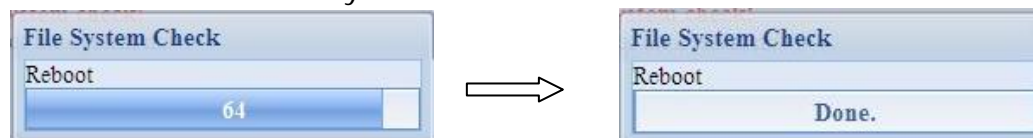


To perform a file system check, click **Apply**.

Once clicked, the following prompt will appear:

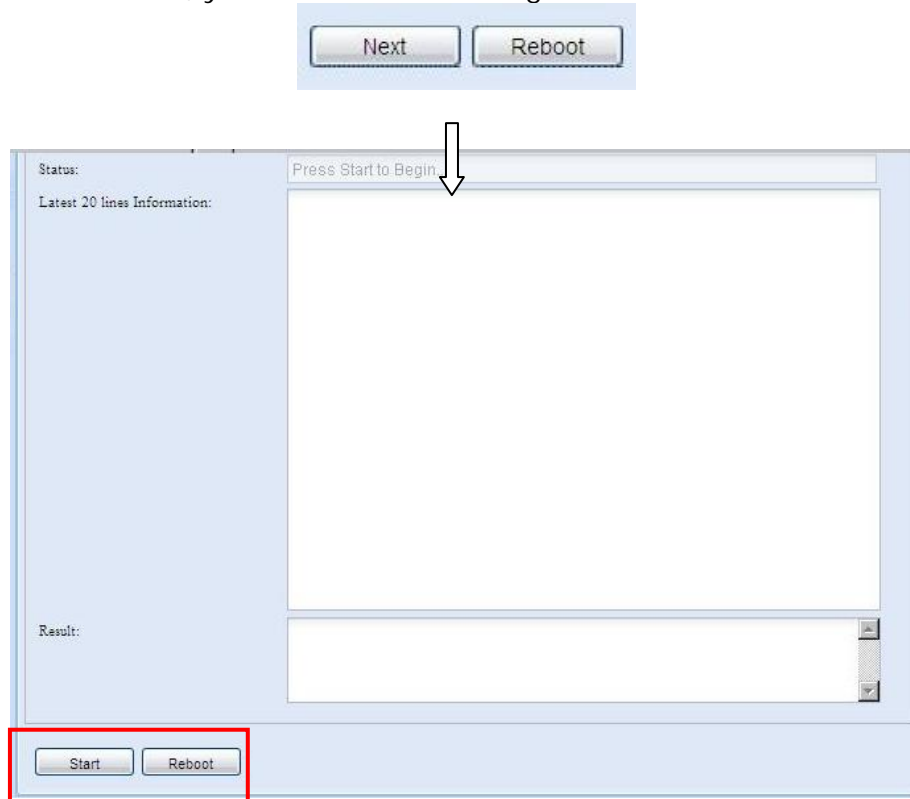


Click **Yes** to reboot the system.

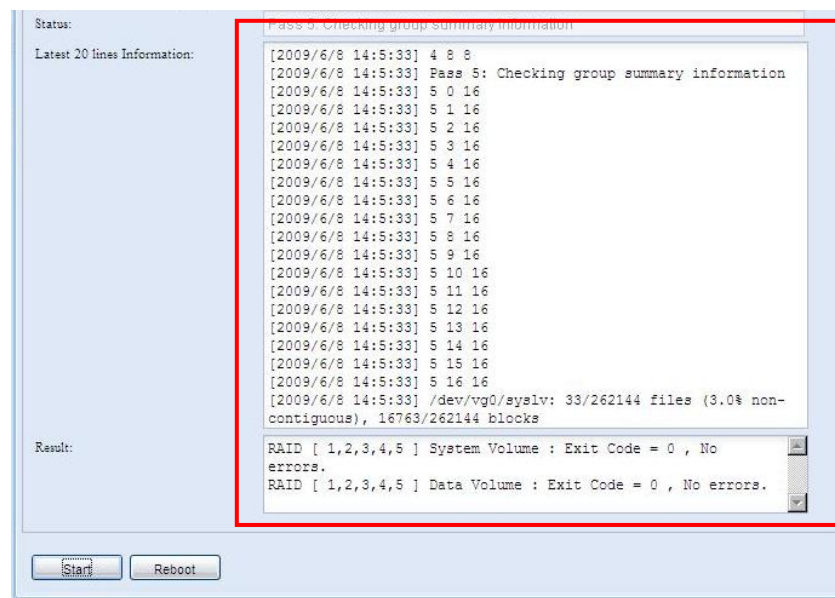


Once the system has rebooted, you will be returned to the **File System Check** prompt. Check the desired RAID volumes and click **Next** to proceed with the file system check. Click **Reboot** to reboot without running the check.

Once you click **Next**, you will see the following screen:



Click **Start** to begin the file system check. Click **Reboot** to reboot the system. When the file system check is run, the system will show 20 lines of information until it is complete. Once complete, the results will be shown at the bottom.



#### NOTE

The system must be rebooted before the NVR can function normally after file system check complete.



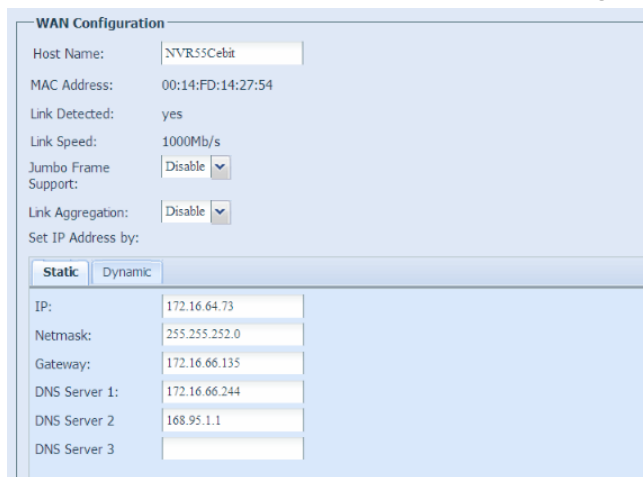
## System Network

Use the **System Network** menu to make network configuration settings as well as service support settings.



### WAN Configuration

From the **System Network** menu, choose **WAN**, and the **WAN Configuration** screen appears. This screen displays the network parameters of the WAN connection. You may change any of these items and press **Apply** to confirm your settings. See a description of each item in the following table:

A screenshot of the 'WAN Configuration' window. It contains several fields: 'Host Name' (NVR55Cebit), 'MAC Address' (00:14:FD:14:27:54), 'Link Detected' (yes), 'Link Speed' (1000Mb/s), 'Jumbo Frame Support' (Disable), and 'Link Aggregation' (Disable). Below these is a section for 'Set IP Address by:' with 'Static' and 'Dynamic' tabs. The 'Static' tab is active, showing fields for 'IP' (172.16.64.73), 'Netmask' (255.255.252.0), 'Gateway' (172.16.66.135), 'DNS Server 1' (172.16.66.244), 'DNS Server 2' (168.95.1.1), and 'DNS Server 3' (empty).

WAN Configuration	
Item	Description
Host name	Host name that identifies the NVR on the network.
MAC Address	MAC address of the network interface.
Jumbo Frame Support	Enable or disable Jumbo Frame Support of the WAN interface on your NVR.
Link Aggregation	Specifies whether WAN and LAN ports will be aggregated and act as one port. <b>Failover:</b> When one port fails, the other one will take over.
Set IP Address by: Static / Dynamic	You can choose a static IP or Dynamic IP, and input your network configuration.
IP	IP address of the WAN interface.
Netmask	Network mask, which is generally: 255.255.255.0
Gateway	Default Gateway IP address.
DNS Server	Domain Name Service (DNS) server IP address.

#### NOTE

- Only use Jumbo Frame settings when operating in a Gigabit environment where all other clients have Jumbo Frame Setting enabled.
- A correct DNS setting is vital to networks services, such as NTP.

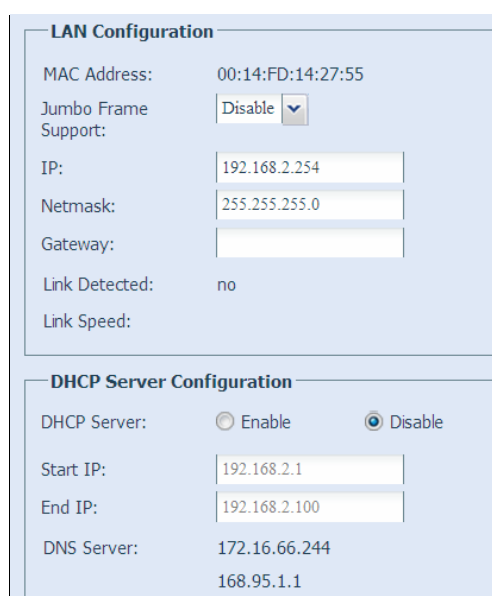
## WARNING

Most Fast Ethernet (10/100) Switches/Routers do not support Jumbo Frame and you will not be able to connect to your NVR after Jumbo Frame is turned on. If this happens, turn off the NVR. Then, press the reset button on the front panel right below power button. System will bring your network settings back to factory default.

## LAN

### LAN Configuration

The NVR supports two Gigabit Ethernet ports for higher service availability. To configure these ports, choose **LAN** from the **System Network** menu, and the **LAN Configuration** screen appears. Press **Apply** to save your changes.



**LAN Configuration**

MAC Address: 00:14:FD:14:27:55

Jumbo Frame Support:

IP: 192.168.2.254

Netmask: 255.255.255.0

Gateway:

Link Detected: no

Link Speed:

**DHCP Server Configuration**

DHCP Server: ☐ Enable ☒ Disable

Start IP: 192.168.2.1

End IP: 192.168.2.100

DNS Server: 172.16.66.244  
168.95.1.1

LAN Configuration	
Item	Description
MAC Address	Displays the MAC address of the LAN interface.
Jumbo Frame Support	Enable or disable Jumbo Frame Support on the LAN interface.
IP	Specifies the IP address of the LAN interface.
Netmask	Specifies the Network Mask of the LAN interface.

## NOTE

Before enabling Jumbo Frame Support, please make sure your network equipment supports Jumbo Frame. If your equipment is incompatible, you might not be able to connect to your NVR.

### DHCP Server Configuration

A DHCP server can be configured to assign IP addresses to devices connected to the LAN port. To configure these ports, choose **LAN** from the **System Network** menu.

DHCP Configuration	
Item	Description
DHCP Server	Enable or disable the DHCP server to automatically assign IP address to PCs connected to the LAN interface.
Start IP	Specifies the starting IP address of the DHCP range.
End IP	Specifies the ending IP address of the DHCP range.
DNS Server	Displayed the DNS server IP address.

## NOTE

The IP Segment of WAN and LAN should not overlap.

## WARNING

The IP address of the LAN interface should not be in the range of the Start IP address and End IP address.

### Samba / CIFS

There are 4 options is currently allow Admin to Enable/Disable to operate NVR associated with Samba / CIFS protocol. With the option changed, it will need to reboot system to activate.

Samba / CIFS		
Samba Service:	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
File Access Cache:	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
Samba Recycle Bin:	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable
Samba Anonymous Login Authentication:	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable
Samba is Native Mode:	<input checked="" type="radio"/> Yes(Native Mode)	<input type="radio"/> No(Compatible Mode)
<input type="button" value="Apply"/>		

#### **Samba Service**

Used for letting the operating system of UNIX series and SMB/CIFS of Microsoft Windows operating system (Server Message Block / Common Internet File System). Do the link in network protocol. Enable or Disable SMB/CIFS protocol for Windows, Apple, Unix drive mapping.

#### **File Access Cache**

File Access Cache is default **Enable**. This option will help to increase the performance while single client access share folder in writing under SMB/CIFS protocol.

#### **Samba Recycle Bin**

The NVR is supported recycle bin via SMB/CIFS protocol. Simply enable it then all of deleted files/folders will reside in the ".recycle" folder with hidden attribution in each share.



In general, Windows has default to invisible all of hidden folders/files. So please enable this option to view ".recycle" folder.

#### **Samba Anonymous Login Authentication**

To enable this option, no matter there is share folder has been created in public access. The user account and password is needed from system to access under SMB/CIFS protocol. On the other hand, no more anonymous login is allowed.

## NOTE

- In some environments, due to security concerns, you may wish to disable SMB/CIFS as a precaution against computer viruses.

## FTP

NVR can act as a FTP server, enabling users to download and upload files with their favorite FTP programs. From the **System Network** menu, choose the **FTP** item, and the **FTP** screen appears. You can change any of these items and press **Apply** to confirm your settings.

The screenshot shows the FTP configuration interface. It includes options to enable or disable FTP and Secure FTP, a port number field set to 21, an encoding dropdown set to UTF-8, an anonymous access dropdown set to Upload/Download, an auto rename checkbox, and sliders for upload and download bandwidth, both set to Unlimited. An Apply button is at the bottom left.

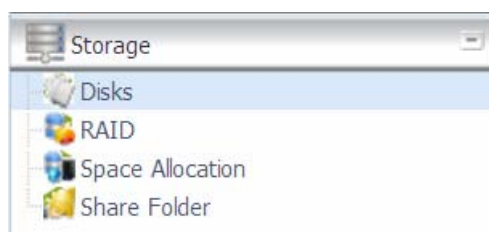
A description of each item follows:

FTP	
Item	Description
FTP	Enable FTP Service on the NVR.
Security FTP	Enable or disable Security FTP, be sure the client FTP software has also security FTP setting enabled.
Port	Specifies the port number of an incoming connection on a non-standard port.
FTP ENCODE	If your FTP client or operating system does not support Unicode (e.g. Windows® 95/98/ME or MAC OS9/8), select the same encoding as your OS here in order to properly view the files and directories on the server. Available options are BIG5, HZ, GB2312, GB18030, ISO, EUC-JP, SHIFT-JIS and UTF-8.
Allow Anonymous FTP Access	<b>Upload/Download:</b> Allow anonymous FTP users to upload or download files to/from public folders. <b>Download:</b> Allow anonymous FTP users to download files from public folders. <b>No access:</b> Block anonymous FTP user access.
Auto Rename	If checked, the system will automatically rename files that are uploaded with a duplicate file name. The renaming scheme is [filename].#, where # represents an integer.
Upload Bandwidth	You may set the maximum bandwidth allocated to file uploads. Selections include <b>Unlimited, 1, 2, 4, 8, 16</b> and <b>32 MB/s</b> .
Download Bandwidth	You may set the maximum bandwidth allocated to file downloads. Selections include <b>Unlimited, 1, 2, 4, 8, 16</b> and <b>32 MB/s</b> .

To access the share folder on the NVR, use the appropriate user login and password set up on the **Users** page. Access control to each share folder is set up on the **ACL** page (**Storage Management > Share Folder > ACL**).

## Storage Management

The **Storage** menu displays the status of storage devices installed in the NVR, and includes storage configuration options such as RAID and disk settings, folder configuration, and space allocation.



### Disks Information

From the **Storage** menu, choose the **Disks** item and the **Disks Information** screen appears. From here, you can see various items about installed SATA hard disks. Blank lines indicate that a SATA hard disk is not currently installed in that particular disk slot.

Disks Information

Disk No.	Capacity (MB)	Model	Firmware	Status	Bad Block Scan
1	1,907,728	WDC WD2002FYPS-0	04.0	OK	Click to start
2	1,907,729	WDC WD2002FYPS-0	04.0	OK	Click to start
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A

Total Capacity: 3815457 (MB)

Disk Power Management

Disk Power Management:

OFF

Minute

Apply

Disks Information	
Item	Description
Disk No.	Indicates disk location.
Capacity	Shows the SATA hard disk capacity.
Model	Displays the SATA hard disk model name.
Firmware	Shows the SATA hard disk firmware version.
Status	Indicates the status of the disk. Can read <b>OK</b> , <b>Warning</b> , or <b>Failed</b> .
Bad Block scan	Yes to start scan Bad Block.
Total Capacity	Shows the total SATA hard disk capacity.
Disk Power Management	The administrator can set the disk to power down after a period of inactivity.

### NOTE

When the Status shows Warning, it usually means there are bad sectors on the hard disk. It is shown only as a precaution and you should consider changing the drives.

### S.M.A.R.T. Information

On the **Disks Information** screen, the status of each disk will be displayed in the **Status** column. Clicking on an **OK** or **Warning** link will display the **S.M.A.R.T Information** window for that particular disk.

You may also perform disk SMART test, simply to click "Test" to start with. The result is only for reference and system will not take any action from its result.

The screenshot shows a window titled "SMART INFO" with a close button in the top right corner. It is divided into two main sections: "Info" and "Test".

**Info Section:**

- Tray Number: 3
- Model: WDC WD800AAJS-00
- Power On Hours: 9722 Hours
- Temperature Celsius: 37
- Reallocated Sector Count: 0
- Current Pending Sector: 0

**Test Section:**

- Test Type: ☒ short ☐ long
- Test Result: Healthy after short test (This text is highlighted with a red rectangular border in the original image.)
- Test Time: Mon Jun 15 11:56:06 CST 2009

At the bottom of the "Test" section is a button labeled "Test".

S.M.A.R.T. Information	
Item	Description
Tray Number	Tray the hard disk is installed in.
Model	Model name of the installed hard disk.
Power ON Hours	Count of hours in power-on state. The raw value of this attribute shows total count of hours (or minutes, or seconds, depending on manufacturer) in power-on state.
Temperature Celsius	The current temperature of the hard disk in degrees Celsius
Reallocated Sector Count	Count of reallocated sectors. When the hard drive finds a read/write/verification error, it marks this sector as "reallocated" and transfers data to a special reserved area (spare area). This process is also known as remapping and "reallocated" sectors are called remaps. This is why, on a modern hard disks, you can not see "bad blocks" while testing the surface - all bad blocks are hidden in reallocated sectors. However, the more sectors that are reallocated, the more a decrease (up to 10% or more) can be noticed in disk read/write speeds.
Current Pending Sector	Current count of unstable sectors (waiting for remapping). The raw value of this attribute indicates the total number of sectors waiting for remapping. Later, when some of these sectors are read successfully, the value is decreased. If errors still occur when reading sectors, the hard drive will try to restore the data, transfer it to the reserved disk area (spare area), and mark this sector as remapped. If this attribute value remains at zero, it indicates that the quality of the corresponding surface area is low.
Test Type	Set short or long time to test.
Test Result	Result of the test.
Test Time	Total time of the test.

## NOTE

If the Reallocated Sector Count > 32 or Current Pending Sector of a hard disk drive > 0, the status of the disk will show "Warning". This warning is only used to alert the system administrator that there are bad sectors on the disk, and they should replace those disks as soon as possible.

### Bad Block Scan

On the **Disks Information** screen, you may also perform disk bad block scan, simply to click "Click to start" to start with. The result is only for reference and system will not take any action from its result.

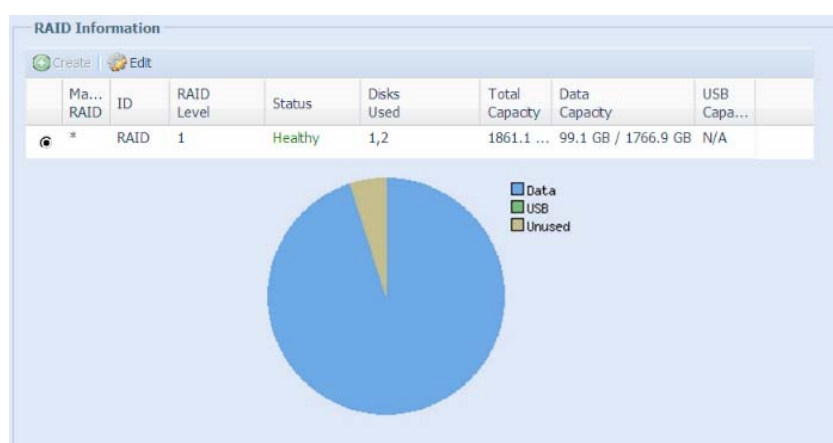
Disks Information					
Disk No.	Capacity (MB)	Model	Firmware	Status	Bad Block Scan
1	1,907,729	WDC WD2002FYPS-0	04.0	OK	Click to start
2	1,907,729	WDC WD2002FYPS-0	04.0	OK	Click to start
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
Total Capacity: 3815457 (MB)					

The testing result will be stay till system reboot with "Yet to start" displayed as default.

### RAID Information

From the **Storage** menu, choose the **RAID** item and the **RAID Information** screen appears.

This screen lists the RAID volumes currently residing on the NVR. From this screen, you can get information about the status of your RAID volumes, as well as the capacities allocated for data, and target USB. There is also a graph which represents how the RAID volume is currently allocated.



RAID Information	
Item	Description
Master RAID	The RAID volume currently designated as the Master RAID volume.
ID	ID of the current RAID volume.

	<b>NOTE: All RAID IDs must be unique.</b>
RAID Level	Shows the current RAID configuration.
Status	Indicates status of the RAID. Can read either <b>Healthy</b> , <b>Degraded</b> , or <b>Damaged</b> .
Disks Used	Hard disks used to form the current RAID volume.
Total Capacity	Total capacity of the current RAID.
Data Capacity	Indicates the used capacity and total capacity used by user data.
USB Capacity	Total capacity of the target USB Device.

### Create a RAID

On the **RAID Information** screen, press the **create** button to go to the **CREATE RAID** screen. In addition to RAID disk information and status, this screen lets you make RAID configuration settings.

Using **Create RAID**, you can select stripe size, choose which disks are RAID disks or the Spare Disk. .

Disk No.	Capacity (MB)	Model	Status	Used	Spare
1	1,907,729	WDC WD2002...	OK	<input type="checkbox"/>	<input type="checkbox"/>
2	1,907,729	WDC WD2002...	OK	<input type="checkbox"/>	<input type="checkbox"/>
3	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
4	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
5	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>

RAID Level: ☐ JBOD ☐ RAID 0 ☐ RAID 1 ☐ RAID 5 ☐ RAID 6 ☐ RAID 10

RAID ID:  ( Allow 0~9, a~z, A~Z ) ☐ Master RAID - Take effect after checked box

Quick Raid: ☐ ( Enable this setting to enhance RAID creation time if there is no partition existed inside of hard disk )

Stripe Size(KB):

RAID Configurations	
Item	Description
Disk No.	Number assigned to the installed hard disks.
Capacity (MB)	Capacity of the installed hard disks.
Model	Model number of the installed hard disks.
Status	Status of the installed hard disks.
Used	If this is checked, current hard disk is a part of a RAID volume.
Spare	If this is checked, current hard disk is designated as a spare for a RAID volume. 1. NVR42/77/88: RAID space default 100% 2. N55: RAID 95% space, USB space default 5% 3. Setting options in the UI can not be modified
Master RAID	Check a box to designate this as the Master RAID volume. See the <b>NOTE</b> below for more information.
Stripe Size	This sets the stripe size to maximize performance of sequential files in a storage volume. Keep the 64K setting unless you require a special file storage layout in the storage volume. A larger stripe size is better for large files.
Data Percentage	The percentage of the RAID volume that will be used to store data.
Create	Press this button to configure a file system and create the RAID storage volume.

To create a RAID volume, follow the steps below:

1. On the **RAID Information** screen, click **create**.



2. On the **RAID Configuration** screen, set the RAID storage space as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5**, **RAID 6**, or **RAID 10** — see [Appendix C: RAID Basics](#) for a detailed description of each.
3. Specify a RAID ID.
4. Specify a stripe size — 64K is the default setting.

Disk No.	Capacity (MB)	Model	Status	Used	Spare
1	1,907,729	WDC WD2002...	OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	1,907,729	WDC WD2002...	OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
4	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
5	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>

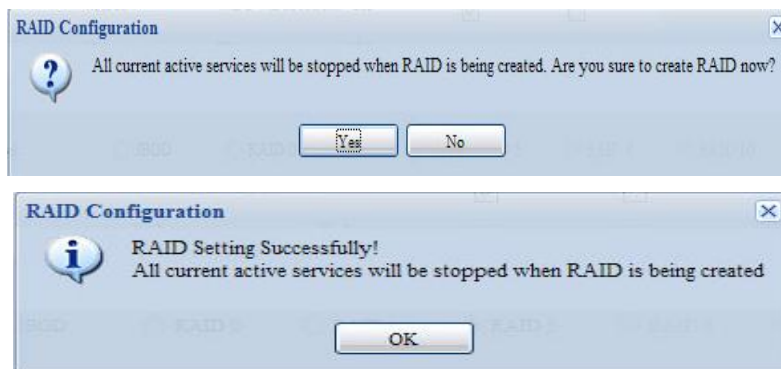
RAID Level: ☐ JBOD ☒ **RAID 0** ☐ RAID 1 ☐ RAID 5 ☐ RAID 6 ☐ RAID 10

RAID ID:  ( Allow 0~9, a~z, A~Z ) ☐ Master RAID - Take effect after checked box

Quick Raid: ☐ ( Enable this setting to enhance RAID creation time if there is no partition existed inside of hard disk )

Stripe Size(KB):

5. Press **Create** to build the RAID storage volume.



#### NOTE

Building a RAID volume may take time, depending on the size of hard drives and RAID mode. In general, while the RAID volume building process is up to “RAID Building” then the data volume is capable to be accessed.

#### WARNING

Creating RAID destroys all data in the current RAID volume. The data is unrecoverable.

With a RAID 1, RAID 5, RAID 6, or RAID 10 volume, you can also add a spare disk after the RAID is created.

For more information on RAID, see [Appendix C: RAID Basics](#).

#### RAID Level

You can set the storage volume as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5**, **RAID 6** or **RAID 10**. RAID configuration is usually required only when you first set up the device. A brief description of each RAID setting follows:

#### RAID Levels

Level	Description
JBOD	The storage volume is a single HDD with no RAID support. JBOD requires a minimum of 1 disk.
RAID 0	Provides data striping but no redundancy. Improves performance but not data safety. RAID 0 requires a minimum of 2 disks.
RAID 1	Offers disk mirroring. Provides twice the read rate of single disks, but same write rate. RAID 1 requires a minimum of 2 disks.
RAID 5	Data striping and stripe error correction information provided. RAID 5 requires a minimum of 3 disks. RAID 5 can sustain one failed disk.
RAID 6	Two independent parity computations must be used in order to provide protection against double disk failure. Two different algorithms are employed to achieve this purpose. RAID 6 requires a minimum of 4 disks. RAID 6 can sustain two failed disks.
RAID 10	RAID 10 has high reliability and high performance. RAID 10 is implemented as a striped array whose segments are RAID 1 arrays. It has the fault tolerance of RAID 1 and the performance of RAID 0. RAID 10 requires 4 disks. RAID 10 can sustain two failed disks.

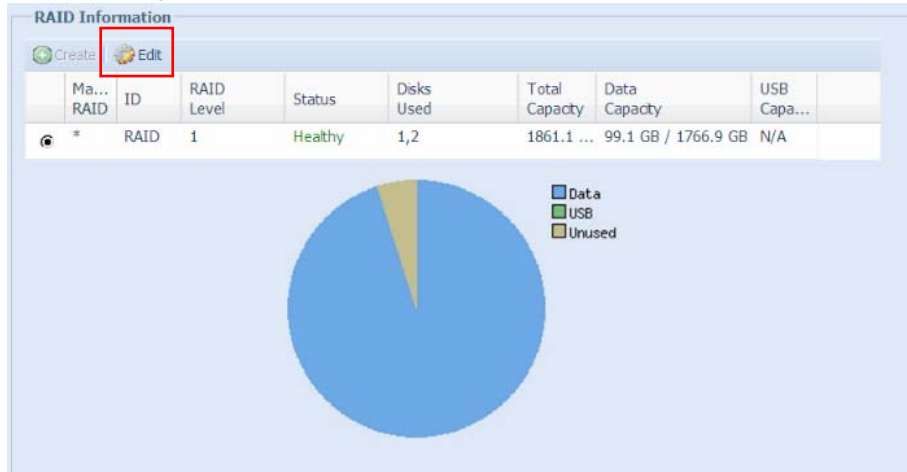
## WARNING

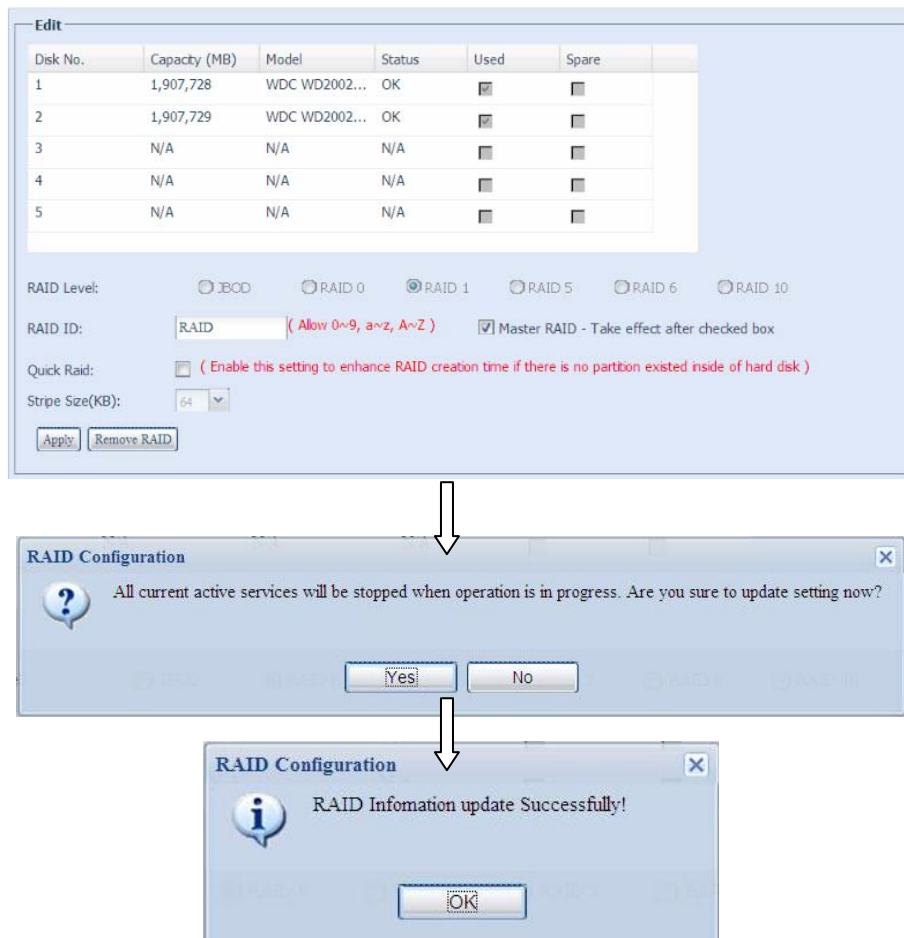
If the administrator improperly removes a hard disk that should not be removed when RAID status is degraded, all data will be lost.

### Edit RAID

On the **RAID Information** screen, press the **Edit** button to go to the **RAID Information** screen.

Using **Edit RAID**, you can select RAID ID and the Spare Disk. .





## Remove RAID

Click to remove the RAID volume. All user data, and target USB data (NVR55 only) been created in selected RAID volume will be removed.

To remove a RAID volume, follow the steps below:

1. On the RAID List screen, select the RAID volume by clicking on its radio button, and click **RAID Information** to open the **RAID Configuration** screen.
2. On the **RAID Configuration** screen, click **Remove RAID**.
3. The confirmation screen appear, you will have to input "Yes" with exactly wording case to complete "**Remove RAID**" operation

**Edit**

Disk No.	Capacity (MB)	Model	Status	Used	Spare
1	1,907,728	WDC WD2002...	OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	1,907,729	WDC WD2002...	OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
4	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
5	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>

RAID Level: ☐ JBOD ☐ RAID 0 ☒ RAID 1 ☐ RAID 5 ☐ RAID 6 ☐ RAID 10

RAID ID:  ( Allow 0~9, a~z, A~Z ) ☒ Master RAID - Take effect after checked box

Quick Raid: ☐ ( Enable this setting to enhance RAID creation time if there is no partition existed inside of hard disk )

Stripe Size(KB):

## WARNING

Remove RAID destroys all data in the current RAID volume. The data is unrecoverable.

## NOTE

1. NVR42/77/88: RAID space default 100%
2. N55: RAID 95% space, USB space default 5%
3. Setting options in the UI can not be modified

## Space Allocation (NVR55 only)

You may specify the space allocated for Target USB volumes.

To do this, under the **Storage** menu, click **RAID** and the **RAID List** window appears. Select the RAID volume you wish to reallocate by clicking on its radio button, and click **Space Allocation**. The **RAID Information** and **Volume Allocation List** windows will appear.

The Volume Allocation List displays the space allocated for **Target USB** volumes on the current RAID volume.

**Space Allocation**

**RAID Information**

Master RAID	ID	RAID Level	Status	Disks Used	Total Capacity	Data Capacity	USB Capacity
*	RAID	1	Healthy	1,2	1861.1	99.2 GB / 1766.9 GB	N/A

**Volume Allocation List**

**Target USB**

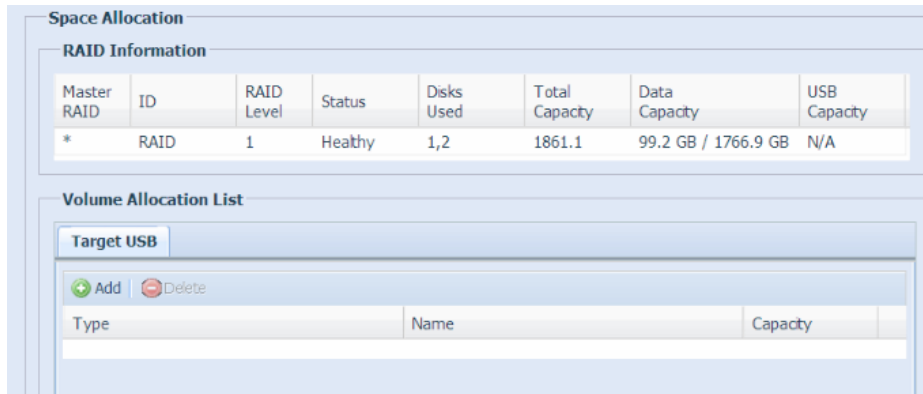
Type	Name	Capacity

Volume Allocation List	
Item	Description
Modify	Click this to modify the allocated space.

Delete	Click this to delete the allocated space.
Target USB	Click to allocate space to USB volume.
Type	Type of volume.
Name	Name assigned to the volume.
Capacity	Capacity of the allocated space.

### Allocating Space for Target USB Volume

1. Under the **Volume Allocation List**, click **Target USB**.  
The **Create Target Volume** screen appears.



2. Designate the percentage to be allocated from the **Allocation** drag bar.
3. Click **OK** to create the USB volume.

Create USB Volume	
Item	Description
RAID ID	ID of current RAID volume.
Unused	Percentage and amount of unused space on current RAID volume.
Allocation	Percentage and amount of space allocated to USB volume.

### Share Folder

From the **Storage** menu, choose **Share Folder**, and the **Folder** screen appears. This screen allows you to create and configure folders on the NVR volume.



### Adding Folders

On the **Folder** screen, press the **Add** button and the **Add Folder** screen appears. This screen allows you to add a folder. After entering the information, press **Apply** to create new folder.



Add Folder	
Item	Description
RAID ID	RAID volume where the new folder will reside.
Folder Name	Enter the name of the folder.
Description	Provide a description the folder.
Browseable	Enable or disable users from browsing the folder contents. If <b>Yes</b> is selected, then the share folder will be browseable.
Public	Admit or deny public access to this folder. If <b>Yes</b> is selected, then users do not need to have access permission to write to this folder. When accessing a public folder via FTP, the behavior is similar to anonymous FTP. Anonymous users can upload/download a file to the folder, but they cannot delete a file from the folder.
Share Folder Limit	Enter the maximum size of the folder in Gigabytes (GB). The folder cannot grow beyond this limit. You can enter a 0 to turn off the share folder limit. This option did not apply while XFS file system selected.
Apply	Press <b>Apply</b> to create the folder.

## NOTE

Folder names are limited to 60 characters. Systems running Windows 98 or earlier may not support file names longer than 15 characters.

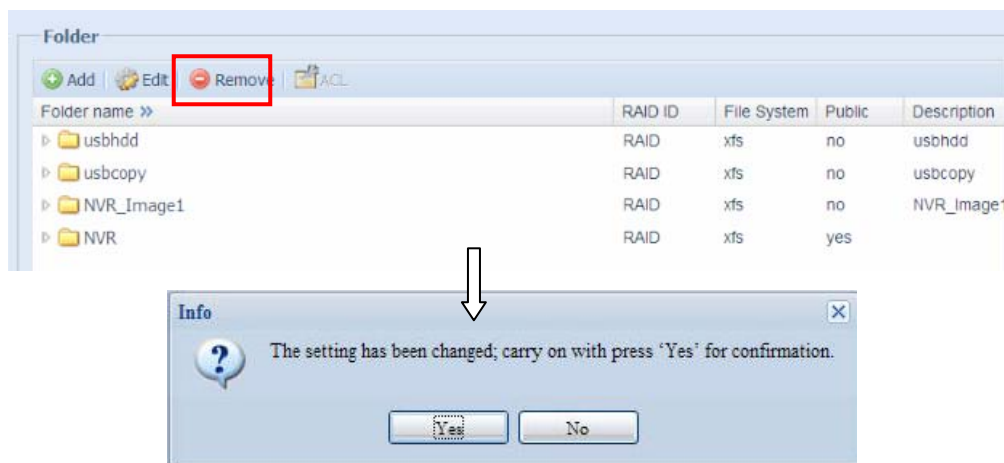
## Modify Folders

On the **Folder** screen, press the **Edit** button and the **Modify Folder** screen appears. This screen allows you to change folder information. After entering the information, press **Apply** to save your changes.

Modify Folder	
Item	Description
RAID ID	RAID volume where the folder will reside.
Folder Name	Enter the name of the folder.
Description	Provide a description the folder.
Browseable	Enable or disable users from browsing the folder contents. This setting will only apply while access via SMB/CIFS and web disk.
Public	Admit or deny public access to this folder.
Share Limit	Enter the maximum size of the folder. The folder will not grow beyond this limit. You can enter a 0 to turn off the share folder limit.

### Remove Folders

To remove a folder, press the **Remove** button from the specified folder row. The system will confirm folder deletion. Press **Yes** to delete the folder permanently or **No** to go back to the folder list.

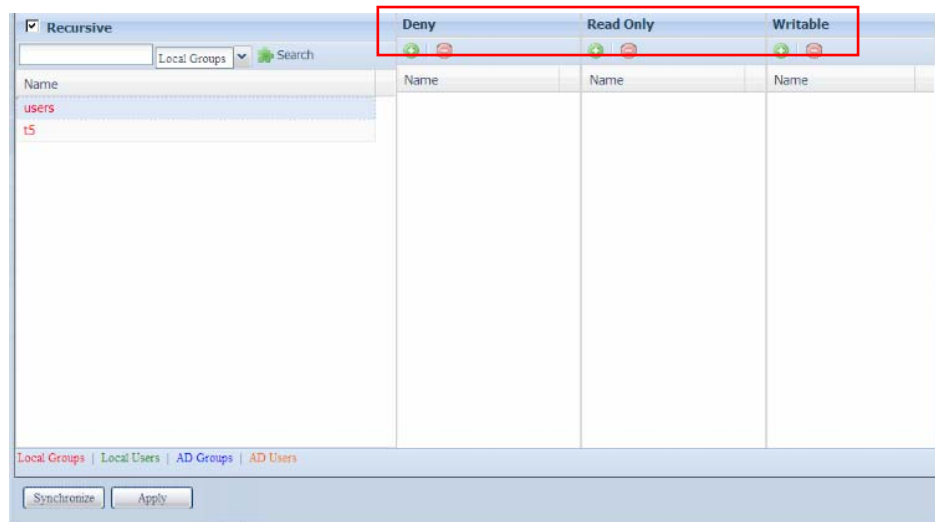


### WARNING

All the data stored in the folder will be deleted once the folder is deleted.  
The data will not be recoverable.


### Folder and sub-folders Access Control List (ACL)

On the Folder screen, press the **ACL** button, and the **ACL setting** screen appears. This screen allows you to configure access to the specific folder and sub-folders for users and groups. Select a user or a group from the left hand column and then choose **Deny**, **Read Only**, or **Writable** to configure their access level. Press the **Apply** button to confirm your settings.



ACL setting	
Item	Description
Deny	Denies access to users or groups who are displayed in this column.
Read Only	Provides Read Only access to users or groups who are displayed in this column.
Writable	Provides Write access to users or groups who are displayed in this column.
Recursive	Enable to inherit the access right for all its sub-folders.

To configure folder access, follow the steps below:

1. On the **ACL** screen, all network groups and users are listed in the left hand column. Select a group or user from this list.
2. With the group or user selected, press one of the buttons from the three access level columns at the top. The group or user then appears in that column and has that level of access to the folder.
3. Continue selecting groups and users and assigning them access levels using the column buttons.
4. To remove a group or user from an access level column, press the **Remove**  button in that column.
5. When you are finished, press **Apply** to confirm your ACL settings.

#### NOTE

If one user has belonged to more than one group but different privilege than the priority Deny > Read Only > Writable

To setup sub-folders ACL, click on "►" symbol to extract sub folders list as screen shot shows below. You may carry on with same steps as share level ACL setting.



Folder name >>	RAID ID	File System	Public	Description
usbhdd	RAID	xfs	no	usbhdd
usbcopy	RAID	xfs	no	usbcopy
NVR_Image1	RAID	xfs	no	NVR_Image1
NVR	RAID	xfs	yes	
test1			yes	
test2			yes	

## NOTE

The ACL can be set for share and sub-folders level, not for files.

The ACL screen also allows you to search for a particular user. To do this, follow the steps below:

1. In the blank, enter the name of the user you would like to find.
2. From the drop down select the group you would like to search for the user in.
3. Click **Search**.

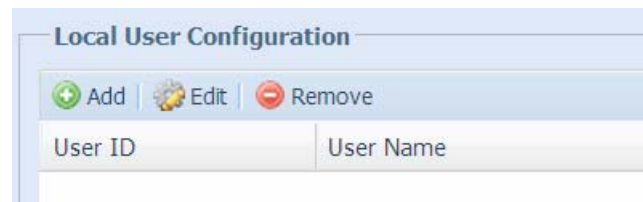
## User and Group Authentication

The NVR has built-in user database that allows administrators to manage user access using different group policies. From the **User and Group Authentication** menu, you can create, modify, and delete users, and assign them to groups that you designate.



## Local User Configuration

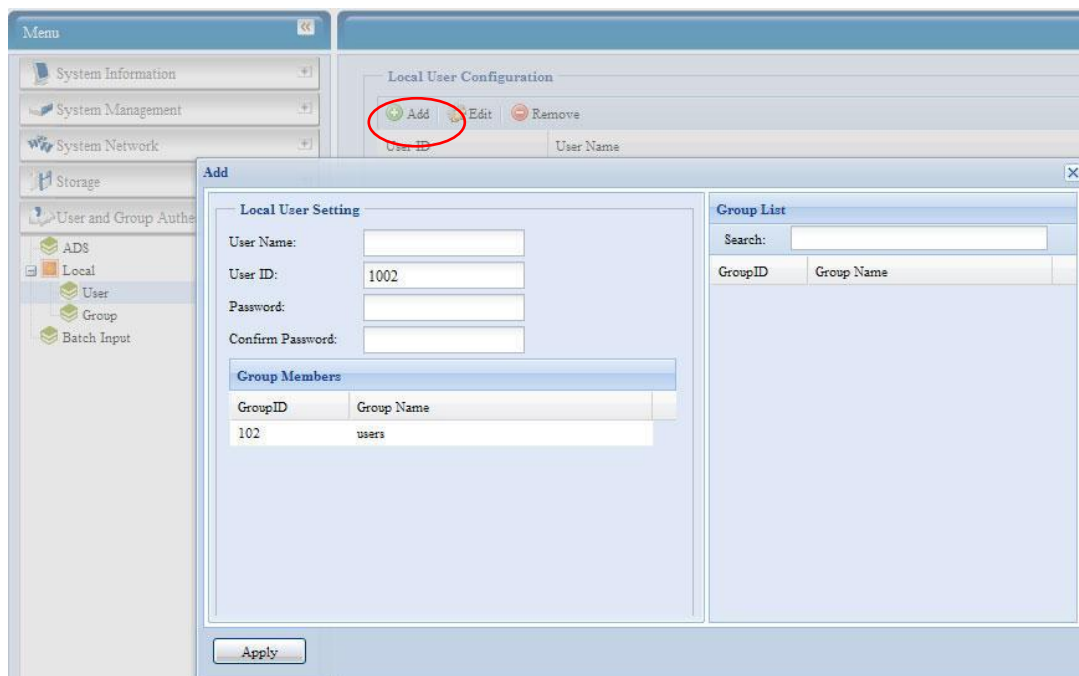
From the **Accounts** menu, choose the **User** item, and the **Local User Configuration** screen appears. This screen allows you to **Add**, **Edit**, and **Remove** local users.



Local User Configuration	
Item	Description
Add	Press the <b>Add</b> button to add a user to the list of local users.
Edit	Press the <b>Edit</b> button to modify a local user.
Remove	Press the <b>Remove</b> button to delete a selected user from the system.

## Add Users

1. Click on the **Add** button on **Local User Configuration** screen, and **Local User Setting** screen appears.
2. On the **Local User Setting** screen, enter a name in the **User Name** box.
3. Enter a **User ID** number. If left blank, the system will automatically assign one.
4. Enter a password in the **Password** box and re-enter the password in the **Confirm** box.
5. Select which group the user will belong to. **Group Members** is a list of groups this user belongs to. **Group List** is a list of groups this user does not belong to. Use the << or >> buttons to have this user join or leave a group.
6. Press the **Apply** button and the user is created.



### NOTE

All users are automatically assigned to the 'users' group.

## Edit Users

1. Select an existing user from the **Local User Configuration** screen.
2. Click on the **Edit** button, and **Local User Setting** screen appears.
3. From here, you can enter a new password and re-enter to confirm, or use the << or >> buttons to have this user join or leave a group. Click the **Apply** button to save your changes.

**Local User Setting**

User Name:

User ID:

Password:

Confirm Password:

GroupID	Group Name
102	users

**Group List**

Search:

GroupID	Group Name
---------	------------

Apply

## Remove Users

1. Select an existing user from the **Local User Configuration** screen.
2. Click on **Remove** button and the user is deleted from the system.

**Local User Configuration**

User ID	User Name
1002	User

**Local User Setting**

Do you want to delete this user?

Displaying topics 1 - 1 of 1

## Local Group Configuration

From the **Accounts** menu, choose the **Group** item, and the **Local Group Configuration** screen appears. This screen allows you to **Add**, **Edit**, and **Remove** local groups.

**Local Group Configuration**

Group ID	Group Name
102	users
140	t5

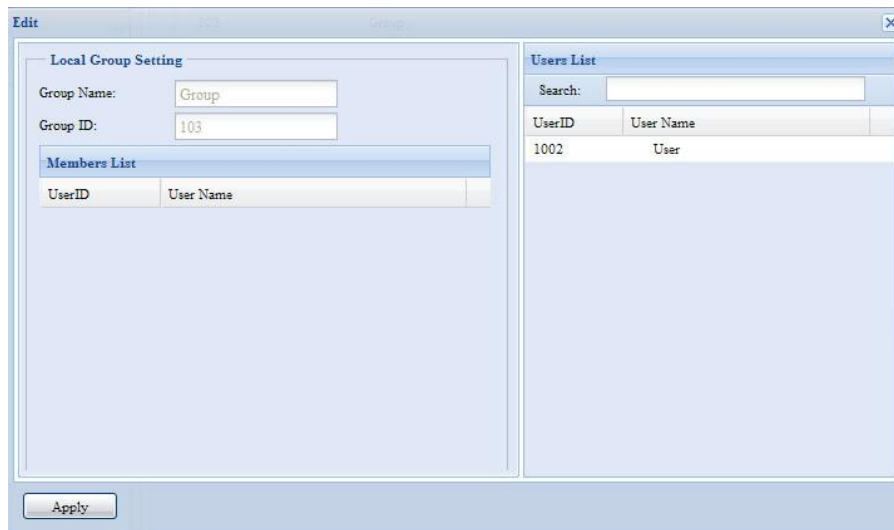
Local Group Configuration	
Item	Description
Add	Press the <b>Add</b> button to add a user to the list of local groups.
Edit	Press the <b>Edit</b> button to modify a selected group from the system.
Remove	Press the <b>Remove</b> button to delete a selected group from the system.

### Add Groups

1. On the **Local Group Configuration** screen, click on the **Add** button.
2. The **Local Group Setting** screen appears.
3. Enter a **Group Name**.
4. Enter a **Group ID** number. If left blank, the system will automatically assign one.
5. Select users to be in this group from the **Users List** by adding them to the **Members List** using the << button.
6. Click the **Apply** button to save your changes.

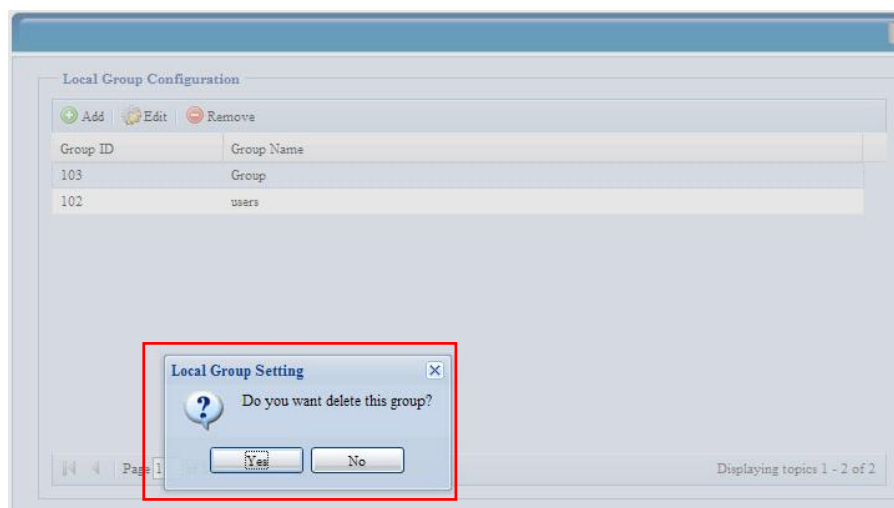
### Edit Groups

1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press the **Edit** button to modify the members in a group.
3. To add a user into a group, select the user from the **Users List**, and press the << button to move the user into the **Members List**.
4. To remove a user from a group, select the user from **Members List**, and press the >> button.
5. Click the **Apply** button to save your changes.



## Remove Groups

1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press **Remove** to delete the group from the system.



## Plug-in Management

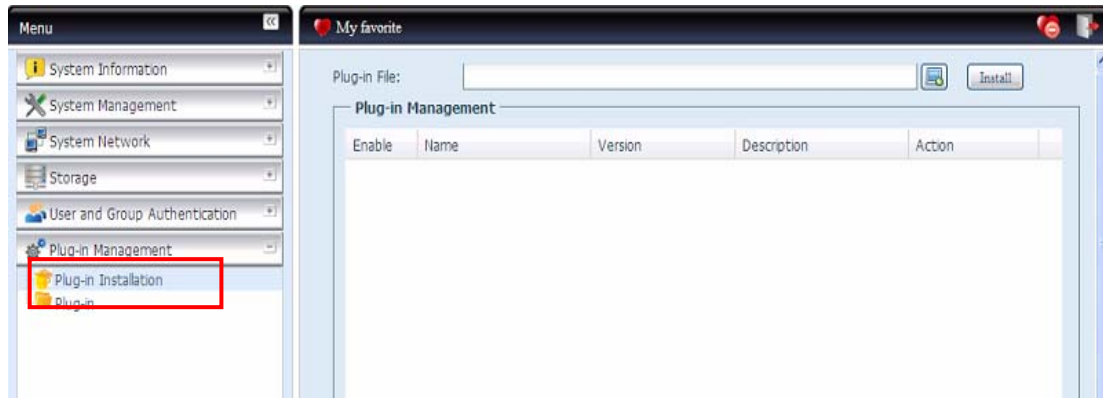
### Plug-in Installation

From the **Plug-in Management** menu, choose the **Plug-in Installation** item and the **Plug-in** screen appears. From here, you can install Thecus NVR software.

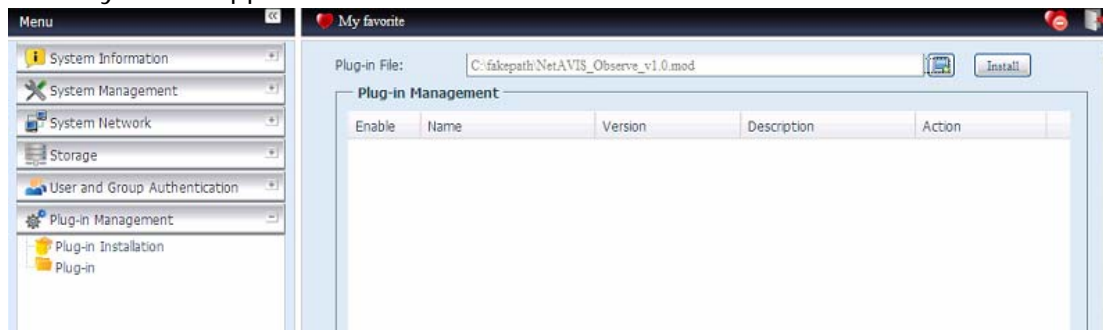


## Plug-in

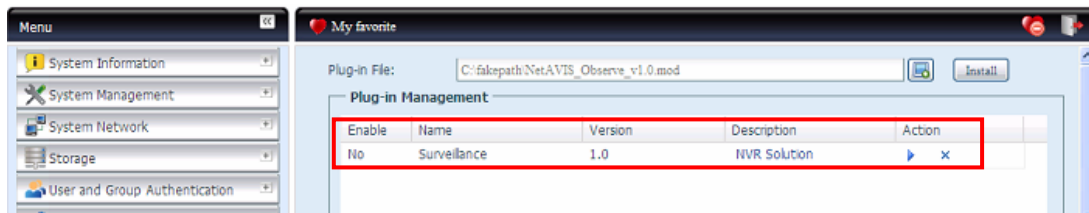
Install Surveillance software into your system. Click "Plug-in Installation".



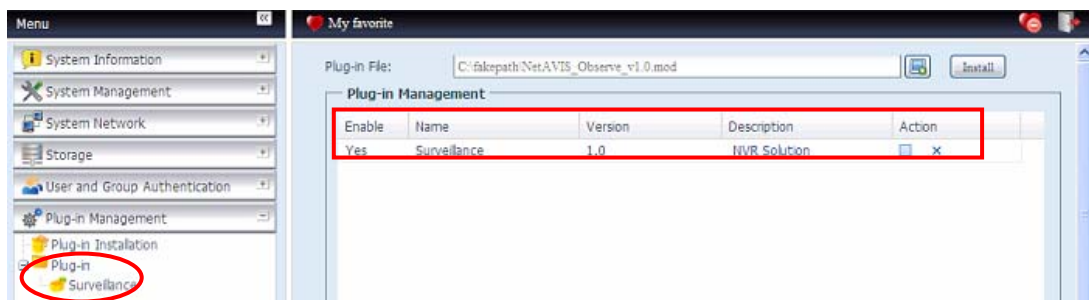
Input the NVR software file located path, it should have CD with license key included when system shipped.



After "install" button has pressed, system will start to install surveillance software. It may take around 1-2 minutes to complete. Then you could see the screen shot like below with "Surveillance" plug in software listed.



Now, it is one step away to complete install Thecus NVR surveillance function. Simply click on "Action" to enable this plug-in software. Then the plug-in software status will change from "No" to "Yes", the plug-in will also have "Surveillance" been listed.



## Appendix A: Product Specifications

### Hardware Specifications

Product Model	NVR42
Network Interfaces	
WAN	Gigabit RJ-45 connector
LAN	Gigabit RJ-45 connector
Storage	
HDD Bays	4 x 3.5" or 5x 2.5" SATA II HDD, hot-swappable
HDD Support	SATA II HDDs up to 2000GB
eSATA	2 x eSATA connector for capacity expansion
I/O Interfaces	
USB Ports	6 x USB type A ports (Host mode),
System Information	
OLED Control Panel	For basic configurations and status display
System LED Display	7 x icons ( HDD Status x4, Network Activity x 2, USB Copy x1)
Physical	
Height	185 mm
Width	170 mm
Depth	250 mm
Power Supply	External power adaptor, 19V input
Security	Lockable disk trays
Environment	
Temperature	5 ~ 40°C
Humidity	20 ~ 85% relative humidity (non-condensing)
Certifications	CE, FCC, BSMI, C-Tick, RoHS Compliant

Product Model	NVR46R	NVR46S
Network Interfaces		
WAN	Gigabit RJ-45 connector	
LAN	Gigabit RJ-45 connector	
Storage		
HDD Bays	4 x 3.5" SATA II HDD, hot-swappable	
HDD Support	SATA II HDDs up to 2000GB	
eSATA	1 x eSATA connector for capacity expansion	
I/O Interfaces		
USB Ports	3 x USB type A ports (Host mode), 1 x USB type B ports (Device mode)	
System Information		
LCD Control Panel	For basic configurations and status display	
System LED Display	4 x LED ( System Busy, Network Activity x 2, System Power)	
Physical		
Height	44 mm	
Width	430.5 mm	
Depth	567.6 mm	
Power Supply	250W redundant power supply 100~240V AC, 50/60Hz	200W power supply 100~240V AC, 50/60Hz
Security	Lockable disk trays	
Environment		
Temperature	5 ~ 40°C	

Humidity	20 ~ 85% relative humidity (non-condensing)
Certifications	CE, FCC, BSMI, C-Tick, RoHS Compliant

Product Model	NVR55
Network Interfaces	
WAN	Gigabit RJ-45 connector
LAN	Gigabit RJ-45 connector
Storage	
HDD Bays	5 x 3.5" or 5x 2.5" SATA II HDD, hot-swappable
HDD Support	SATA II HDDs up to 2000GB
eSATA	1 x eSATA connector for capacity expansion
I/O Interfaces	
USB Ports	5 x USB type A ports (Host mode), 1 x USB type B ports (Device mode)
System Information	
LCD Control Panel	For basic configurations and status display
System LED Display	5 x LED ( System LED, Network Activity x 2, USB Copy, System warning)
Physical	
Height	230 mm
Width	190 mm
Depth	240 mm
Power Supply	Server-rated AC power supply 100/220V AC, 50/60Hz, Auto-detect
Security	Lockable disk trays
Environment	
Temperature	5 ~ 40°C
Humidity	20 ~ 85% relative humidity (non-condensing)
Certifications	CE, FCC, BSMI, C-Tick, RoHS Compliant

Product Model	NVR77
Network Interfaces	
WAN	Gigabit RJ-45 connector
LAN	Gigabit RJ-45 connector
Storage	
HDD Bays	7 x 3.5" SATA HDD, hot-swappable
eSATA	1 x eSATA connector for capacity expansion
I/O Interfaces	
USB Ports	4 x USB type A ports (Host mode),
System Information	
LCD Control Panel	For basic configurations and status display
System LED Display	6 x LED ( Power LED, System LED, Network Activity x 2, USB Copy, eSATA activity)
Physical	
Height	230 mm
Width	190 mm
Depth	240 mm
Power Supply	Server-rated AC power supply 100/220V AC, 50/60Hz, Auto-detect
Security	Lockable disk trays
Environment	
Temperature	5 ~ 40°C



Humidity	20 ~ 85% relative humidity (non-condensing)
Certifications	CE, FCC, BSMI, C-Tick, RoHS Compliant

Product Model	NVR88
Network Interfaces	
WAN	Gigabit RJ-45 connector
LAN	Gigabit RJ-45 connector
Storage	
HDD Bays	8 x 3.5" SATA HDD, hot-swappable
eSATA	1 x eSATA connector for capacity expansion
I/O Interfaces	
USB Ports	4 x USB type A ports (Host mode),
System Information	
LCD Control Panel	For basic configurations and status display
System LED Display	2 x LED ( Power LED, System alert)
Physical	
Height	87 mm
Width	430 mm
Depth	600 mm
Power Supply	Server-rated AC power supply 100/220V AC, 50/60Hz, Auto-detect NVR88-- 350W Redundant Power Supply
Security	Lockable disk trays
Environment	
Temperature	5 ~ 40°C
Humidity	20 ~ 85% relative humidity (non-condensing)
Certifications	CE, FCC, BSMI, C-Tick, RoHS Compliant

## Software Specifications

Network File Protocols	Microsoft Networks (CIFS/SMB) File Transfer Protocol (FTP)
Authentication	Local User Account
Network Client Type	Microsoft Windows NT/2000/XP/2003/Vista/7 Unix/Linux/BSD
Network Configuration	Fixed IP address Dynamic IP address failover for network binding
Disk Management	Disk status monitoring (S.M.A.R.T.) Disk idle spin-down
RAID	RAID 0, 1, 5, 6, 10 and JBOD Auto rebuild Hot swappable Hot spare
Folder Management	Share and sub-folder level permission Public folder
Quota Management	Share folder quota control
System Management	Web GUI Multilingual support (English, French, German, Italian, Traditional Chinese, Simplified Chinese, Japanese, Korean, Spanish, Russian and Polish) NTP support

Event Notification	Email notification Buzzer notification LCD
UPS Support	UPS monitoring via RS-232 or USB interface , and system shutdown on low battery
Supported USB Devices	External HDD/flash disk
Setup Utility	Windows 2000/XP/2003/7 MAC OS X

## Appendix B: Customer Support

If your NVR is not working properly, we encourage you to check out **Chapter 7: Troubleshooting**, located in this manual. You can also try to ensure that you are using the latest firmware version for your NVR. Thecus is committed to providing free firmware upgrades to our customers. Our newest firmware is available on our Download Center:

<http://www.thecus.com/download.php>

If you are still experiencing problems with your NVR, or require a Return Merchandise Authorization (RMA), feel free to contact technical support via our Technical Support Website:

[http://www.thecus.com/support\\_tech.php](http://www.thecus.com/support_tech.php)

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## **Appendix C: RAID Basics**

### **Overview**

A Redundant Array of Independent Disks (RAID) is an array of several hard disks that provide data security and high performance. A RAID system accesses several hard disks simultaneously, which improves I/O performance over a single hard disk. Data security is enhanced by a RAID, since data loss due to a hard disk failure is minimized by regenerating redundant data from the other RAID hard disks.

### **Benefits**

RAID improves I/O performance, and increases data security through fault tolerance and redundant data storage.

### **Improved Performance**

RAID provides access to several hard disk drives simultaneously, which greatly increases I/O performance.

### **Data Security**

Hard disk drive failure unfortunately is a common occurrence. A RAID helps prevent against the loss of data due to hard disk failure. A RAID offers additional hard disk drives that can avert data loss from a hard disk drive failure. If a hard drive fails, the RAID volume can regenerate data from the data and parity stored on its other hard disk drives.

### **RAID Levels**

The Thecus NVR supports standard RAID levels 0, 1, 5, 6, 10, and JBOD. You choose a RAID level when you create a system volume. The factors for selecting a RAID level are:

- Your requirements for performance
- Your need for data security
- Number of hard disk drives in the system, capacity of hard disk drives in the system

The following is a description of each RAID level:

#### **RAID 0**

RAID 0 is best suited for applications that need high bandwidth but do not require a high level of data security. The RAID 0 level provides the best performance of all the RAID levels, but it does not provide data redundancy.

RAID 0 uses disk striping and breaking up data into blocks to write across all hard drives in the volume. The system can then use multiple hard drives for faster read and write. The stripe size parameter that was set when the RAID was created determines the size of each block. No parity calculations complicate the write operation.

#### **RAID 1**

RAID 1 mirrors all data from one hard disk drive to a second one hard disk drive, thus providing complete data redundancy. However, the cost of data storage capacity is doubled.

This is excellent for complete data security.

## **RAID 5**

RAID 5 offers data security and it is best suited for networks that perform many small I/O transactions at the same time, as well as applications that require data security such as office automation and online customer service. Use it also for applications with high read requests but low write requests.

RAID 5 includes disk striping at the byte level and parity information is written to several hard disk drives. If a hard disk fails the system uses parity stored on each of the other hard disks to recreate all missing information.

## **RAID 6**

RAID 6 is essentially an extension of RAID level 5 which allows for additional fault tolerance by using a second independent distributed parity scheme (dual parity) Data is striped on a block level across a set of drives, just like in RAID 5, and a second set of parity is calculated and written across all the drives; RAID 6 provides for an extremely high data fault tolerance and can sustain two simultaneous drive failures.

This is a perfect solution for mission critical applications.

## **RAID 10**

RAID 10 is implemented as a striped array whose segments are RAID 1 arrays. RAID 10 has the same fault tolerance as RAID level 1.

RAID 10 has the same overhead for fault-tolerance as mirroring alone. High I/O rates are achieved by striping RAID 1 segments.

Under certain circumstances, RAID 10 array can sustain up to 2 simultaneous drive failures

Excellent solution for applications that would have otherwise gone with RAID 1 but need an additional performance boost.

## **JBOD**

Although a concatenation of disks (also called JBOD, or "Just a Bunch of Disks") is not one of the numbered RAID levels, it is a popular method for combining multiple physical disk drives into a single virtual one. As the name implies, disks are merely concatenated together, end to beginning, so they appear to be a single large disk.

As the data on JBOD is not protected, one drive failure could result total data loss.

## ***Stripe Size***

The length of the data segments being written across multiple hard disks. Data is written in stripes across the multiple hard disks of a RAID. Since multiple disks are accessed at the same time, disk striping enhances performance. The stripes can vary in size.

## ***Disk Usage***

When all 5 disks are of the same size, and used in RAID, NVR disk usage percentage is listed below:

RAID Level	Percentage Used
RAID 0	100%
RAID 1	$1/n \times 100\%$
RAID 5	$(n-1)/n \times 100\%$
RAID 6	$(n-2)/n \times 100\%$
RAID 10	50%
JBOD	100%

n : HDD number

## Appendix D: Licensing Information

### Overview

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